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Annual Report to the Congress

Frank C. Carlucci
Secretary of Defense

Fiscal Year 1990

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Report of the Secretary of Defense
Frank C. Carlucci
to the Congress

on the
FY 1990 / FY 1991 Biennial Budget
and
FY 1990-94 Defense Programs
January 17, 1989

This Report Reflects the
FY 1990 / FY 1991 Biennial Budget
as of January 9, 1989

United States/Soviet Resource Comparison Charts are estimates only.

Boundary representetions ere not necessarily euthoritative. The United Stetes does not recognize the incorporetion of Estonia, Letvie, end Lithuenie into the Soviet Union.

TO THE CONGRESS OF THE UNITED STATES

For four decades, every U.S. Secretary of Defense has reported to the American people a relentlessly foreboding international security picture: the global expansion of communism; the explosive growth of Soviet military power; the assaults on freedom around the world; the spread of terrorism; and the increasing danger of regional conflicts. Today, even though America and her allies still face these serious security challenges, there are promising new international developments that may provide hope for a much safer world.

As highlighted in this *Annual Report to the Congress*, we are now seeing encouraging signs that critical goals of U.S. and allied security policies are being achieved. Most noteworthy, we find indications that leaders in the Soviet Union may be seeking alternatives to military dominance as a means of advancing their interests. Our challenge is becoming how to cope with success -- how to sustain our progress and guard against reversals.

The key to continuing America's security successes is to recognize the pivotal importance of *strength*. United States military strength remains essential to ensure our survival, protect our interests abroad, and encourage diplomatic initiatives to reduce arms and resolve conflicts.

This report outlines a sound, affordable program to maintain adequate U.S. military strength as we continue to work toward the safer world we hope to see. This program will enable us to sustain the readiness achieved in this decade, and to complete the fielding of modern systems we need now and for the foreseeable future. In spite of encouraging signs in our security outlook, this program recognizes that there is not yet any actual reduction in Soviet military power that could justify cutting back our forces.

The budget requested to support this program promises a high return on our dollars spent. We have made many hard choices to arrive at a plan that minimizes program stretch outs and makes full use of economic production rates. Substantial reductions in the budget proposal will negate these cost-saving measures and require force structure cuts as well. In sum, the consequences of such reductions would work to the detriment of America's long-term security interests.

America and her allies have grown much stronger in the past decade and have witnessed the positive results of our policies of strength, resolve, and cohesion. Consequently, we are better prepared to face the security challenges that lie ahead. The United States Congress has been a full partner in our defense achievements, and I appreciate the cooperation we have had on behalf of our common security aims. I am also grateful to President Reagan and the American people for affording me the honor and responsibility of contributing to the protection of America and her values, and I salute the many thousands of people with whom I have been privileged to share this solemn duty.

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Part I
Defense Policy

A. INTRODUCTION

1. Security Lessons of the 1980s

Presented in this FY 1990 *Annual Report to the Congress* is a defense program to protect America in the coming decade -- a decade that may well usher in a new era in international security, yet a decade sure to be influenced by U.S. defense strength and policies. This Report comes amid promising international developments:

- While the Soviet Union remains the world's greatest potential threat to peace and freedom, Kremlin leaders are at least talking about adopting a less menacing military posture and applying a standard of "reasonable sufficiency" to govern decisions on their military force levels. Chairman Gorbachev's recent announcement of unilateral force reductions appears to be a step in the right direction.

- Chairman Gorbachev's proposed economic and political reforms offer us hope that the Kremlin will pay more attention to its internal affairs and less to expanding its external influence through military means.

- The ongoing withdrawal of Soviet forces from Afghanistan is important for U.S. and allied interests, and it may reflect some Kremlin recognition of the difficulties of external adventurism, especially when resistance is strong.

- Around the world, many countries are embracing market economies and abandoning centralized state-run economic systems. At the same time, many nations are achieving greater democracy; witness the steady progress in Argentina, Brazil, the Philippines, and South Korea.

- We are seeing a greater willingness to resolve conflict through negotiation: in the Iran-Iraq War, in Angola, and in Cambodia.

As favorable as these developments are, we and our allies still have ample cause for caution. With respect to Soviet changes, we should realize that:

- Military "reforms" and force reductions have yet to be implemented, and the implications of these reductions will depend significantly on the details. We will need to see if and how these are translated into a less threatening, less offensively oriented military posture. For the present, Warsaw Pact forces remain organized and deployed for offensive operations against Western Europe.

- The results of economic reforms are uncertain. Even if reforms take hold, the results may not be favorable to U.S. interests. The primary outcome could conceivably be a more efficient Soviet military-industrial machine with which to advance Kremlin aims.

- There is no evidence that Gorbachev and his allies will abandon communism or their drive to expand Soviet influence. Where the Soviets are pulling back -- in Afghanistan, Angola, and Cambodia -- the catalyst has been anti-Soviet opposition, not a change in Kremlin ideology. All indications are that Soviet leaders remain committed to increasing their foreign influence -- at least until confronted with formidable resistance. They still seek to divide us from our allies, although their tactics have become more sophisticated.

In view of the differences between declared intentions and actual trends, democratic peoples must guard against complacency. Many in the West, in their desire to divert defense funds to other societal needs, are prone to put the best face on Soviet reforms. Yes, we should applaud and encourage Kremlin changes that are consistent with our interests, but we must be guided by realism, not wishful thinking. The West's security preparations must be based not on Kremlin declarations, but on actual Soviet military capabilities.

Of course not all recent security developments can be traced to the actions of Western nations, but we can draw important lessons from this decade to guide our security policies in the coming years.

Lesson 1: Security requires strength and cohesion. To deter Soviet aggression and intimidation, democratic nations collectively must be strong enough militarily to convince Moscow that aggression either would not succeed, or would entail unacceptable costs. We also must have cohesive alliances, since only our combined strength and resolve can achieve the necessary level of deterrence.

For free nations, there is no substitute for this strength and cohesion. We should work toward better relations with Moscow, but we cannot base our security on the Kremlin's professed benign intentions. Yet some in the West ignore this lesson and advocate that we lower our defense preparations to encourage the Kremlin to continue its reforms. Still others believe that technology transfers will give Moscow the incentive to prefer peace.

History clearly shows that none of these alternatives can replace a strong defense posture. While we

must explore all opportunities to ease tensions, only the strength and cohesion of America and other democracies can ensure a stable world order in which hostile nations are dissuaded from threatening our interests. With little hope of intimidating or splintering the United States and its allies, our adversaries will have no choice but to look to *non*-military means to advance their aims. As the INF experience has shown, the path to productive negotiations on political and security issues is paved, not with indecision and weakness, but with resolve and strength.

Lesson 2: Free nations must be willing to act to protect their interests. When their interests are threatened, free nations must be willing to act -- to take up arms if necessary -- to protect those interests. Without the will to use our strength, we lose our credibility with our adversaries as people willing to defend ourselves. Lack of resolve will only invite additional threats to our interests.

The best recent example of this lesson occurred in the Persian Gulf. There, in an area of vital interest to the United States and its allies, President Reagan pursued a broad strategy to counter escalating threats to Free World interests. The strategy included a major international diplomatic effort to end the Iran-Iraq War and strengthen our long-standing support for the security of friendly nations in the Gulf region. The President also made the politically sensitive decision to respond to Kuwait's request for protection of a limited number of U.S.-registered tankers transporting Kuwaiti oil. The goal was to prevent Iran from intimidating Kuwait and our other Gulf friends, thereby gaining dominance over shipping lanes and energy resources throughout the area. We also sought to deny the Soviet Union greater influence in the region, which might jeopardize the West's access to Gulf oil.

The actions of the United States -- and several of our European allies -- protected our vital interests and hastened recent progress toward peace and stability in the Gulf region. Warnings or half-hearted measures would not have worked. Moreover, our failure to act would have severely undermined the long-term credibility of our pledge to support friendly nations, both in the Gulf and around the world.

The importance of America's willingness to act was also illustrated in our 1983 rescue operation in Grenada and our 1986 attack on terrorist bases in Libya. While U.S. defense strategy is to deter threats to our interests, we also must be willing to *act* to ensure the credibility of our deterrent strategy and to defend our interests, should deterrence fail.

Lesson 3: Support for nations and movements friendly to our interests is a uniquely effective way to

protect those interests. The United States and its allies can safeguard their interests by supporting less-developed nations that share our aims -- through economic and security assistance, training, and equipment. Such security assistance is a very cost-effective vehicle for more wealthy nations to bolster their own security, while helping friendly peoples protect themselves. During the 1980s, the benefits of carefully planned security assistance remained considerable. Yet U.S. funding dropped dramatically, and the Congress earmarked an increasing percentage of funds to a few recipients. As a result, in many countries we forfeited valuable opportunities for help and influence. Indeed, in some we could not even sustain the equipment and other assistance we previously provided.

Consistent and enduring U.S. support is especially critical to the success of democratic, nationalist movements around the world. Where support to freedom fighters is strong and sustained -- as ours was in Afghanistan -- the payoff can be enormous, both for the United States, the community of free nations, *and* for the people who successfully defeat tyranny. Where such support is weak or wavering -- as ours is in Nicaragua -- we neglect an opportunity to promote democracy and thus diminish our *own* security.

Lesson 4: Arms control can serve U.S. interests, but only if we deal from strength and clearly understand our goals. One positive legacy of the 1980s will be the establishment of several important arms control precedents:

- A treaty that for the first time not only reduces arms, but actually eliminates an entire category of nuclear weapons -- Intermediate-range Nuclear Force (INF) missiles.

- Asymmetrical reductions in force levels, as agreed to in the INF Treaty. Here the Soviets have agreed to make larger reductions than the United States since they had larger forces to begin with.

- A commitment to effective verification of treaty provisions, to include on-site inspections.

- Substantial progress toward deep reductions in strategic nuclear arms.

- The United States' refusal to continue indefinitely its unilateral adherence to the SALT II agreement, provisions of which the Soviet Union has violated.

In the coming decade, we can reach arms control agreements with the Soviet Union that serve American and allied interests if we continue to negotiate from a position of strength. The INF negotiations showed that we must modernize our forces and be willing to deploy

them if we are to convince Moscow to negotiate seriously. If we were unilaterally to forego needed weapons modernization or reduce our force levels, there would be less incentive for Soviet leaders to negotiate mutual reductions and codify limits on their forces at lower levels.

Above all, we must remember that our goal in arms control is greater security and a safer world. Our specific aims must remain:

- Increased stability to ensure that nuclear weapons, however many exist, would never be used -- either by design, miscalculation, or accident.

- Verifiable, militarily significant arms reductions that enhance our security.

- Greater "predictability" on the nature, pace, and scope of each side's military preparations, to reduce distrust and misinterpretations.

2. U.S. Values and Interests

America's values and interests -- the protection of which is the aim of our security policies and posture -- are likely to stay essentially the same in the coming years, as they have in recent decades. Our paramount security interest will remain the preservation of the United States as a free and independent nation, with our fundamental institutions and values intact.

What is relatively new in America's history is the extent to which the destiny of the United States depends on conditions beyond our shores. As President Reagan said in his 1988 *National Security Strategy of the United States*, "An open world of enterprise and the free movement of people, goods, and ideas are not only the keys to our prosperity, but basic moral principles. We see an expanding global prosperity as enhancing our own." With the growing interdependence of nations, America no longer has the luxury of political, economic, or military isolationism. The entire world is our ecological home, our marketplace, and so our security posture must remain global as well.

America has a vital interest in the strength and cohesion of democratic nations. We promote security alliances of free nations because such partnerships best defend freedom and other shared interests. Within alliances, each nation should contribute to collective security requirements in ways appropriate for it, and to an extent commensurate with its relative ability to do so.

As a moral and security imperative, America seeks an international order that encourages self-determination, democratic institutions, economic development, and human rights. We oppose the expansion of influence or territorial control by nations hostile to freedom and other fundamental values shared by democratic nations. Where people are denied freedom, we support their right to fight for an end to repression. We believe that when populations are free to control their political and economic destiny, they usually will chart a course unthreatening to America's interests and values.

The United States promotes the cooperation of nations and the peaceful resolution of disputes among them. We seek to make international institutions more effective in promoting security, stability, and political, economic, and social progress.

While total disarmament would invite cheating and therefore should not be our goal, we fully support the negotiation of equitable and verifiable arms reduction agreements. We also seek to prevent the spread of nuclear weapons and destabilizing technologies, and to achieve an effective, verifiable, and global ban on chemical and biological weapons.

3. The Defense Planning Process

The Department of Defense formulates its defense programs and budget using the planning process depicted in Chart I.A.1. As shown, our military requirements are determined by the threats to our interests and the strategy we follow to counter these threats. We design programs to research, develop, acquire, field, and maintain the appropriate forces to execute our military strategy. These programs, in the aggregate, comprise our defense budget.

America's broad national security *interests* are highlighted in this chapter, while specific regional interests are detailed in Chapter I.D. *Threats* to U.S. interests are analyzed in Chapter I.B. Our military *strategy* and major policies to counter these threats are discussed in Chapter I.C. Part II of this report discusses the resources available for national defense, while Part III outlines our programs to field the forces needed to support our defense strategy.

Our defense programs and the character of our forces change only gradually from budget to budget, reflecting the general stability of U.S. interests and the threats to them. Equally stable is our general strategy of deterrence through nuclear and conventional strength, forward deployment of forces, and alliances with friendly nations. In most cases, a new defense program comes into being to replace aging equipment or to counter a new security threat.

The Defense Planning Process

Chart I.A.1

Identifying U.S. national values and security interests;

Assessing the threat to these values and interests;

Formulating defense policy and military strategy for responding to threats and securing national interests; and

Determining the most effective mix of forces, weapons, and manpower to execute our defense policy and military strategy.

4. Defense Budget Trends and Priorities

a. Budget Trends

This FY 1990-91 defense budget request proposes to set America on a stable, prudent course for ensuring our security. Its recommended real growth -- while not making up for recent deep cuts in defense spending -- will enable us to maintain readiness and force levels sufficient to keep our security risks tolerable. Full funding of our FY 1990-91 defense plan is especially critical in view of the reductions of recent years. As shown in Table I.A.1, since FY 1985 DoD has absorbed an 11 percent cut in budget authority, as corrected for inflation.

Our FY 1990-91 defense plan is the product of intense scrutiny. To stay within the President's fiscal guidance, we have had to make difficult choices -- foregoing defense improvements that are needed, but currently not affordable. The $300 billion reduction incurred in our five-year defense plan between January 1987 and January 1989 is indicative of the severity of our recent budget surgery.

b. Budget Priorities

To achieve such deep reductions with the least damage to our security, I directed that we follow specific priorities in our FY 1990-91 defense plan. This will ensure that we obtain the best military posture for the money. These are the same priorities I applied in cutting $33 billion from our FY 1989 budget as a result of the November 1987 budget summit:

- *Personnel Quality:* We must support adequate pay and other programs necessary to attract and retain highly capable people for our armed forces. The quality of our people will determine the strength of our forces.

- *Readiness:* We must preserve the gains achieved in recent years; "hollow" forces will not deter aggression.

- *Efficient Acquisition:* We must select and fund defense systems at stable purchasing levels and economic production rates.

My aim has been to make sure that no one element of our defense posture assumes an unacceptable degree of risk as a result of inadequate funding. We want no weak links -- no disabling vulnerabilities. Therefore, we

DoD Budget Authority
(Dollars in Billions)

Table I.A.1

	Current Dollars	1989 Dollars	Percent Real Growth
FY 1985	286.8	335.7	
FY 1986	281.4	321.0	−4.4
FY 1987	279.5	309.2	−3.7
FY 1988	283.8	303.1	−2.0
FY 1989	290.2	299.3	−1.3
FY 1990 (Proposed)	305.6	305.6	2.1
FY 1991 (Proposed)	320.9	311.9	2.0

have accepted a smaller force to ensure that it is a *ready*, effective force.

In pursuing efficient acquisition, our goal remains to avoid program "stretch outs" -- that is, lengthening the number of years it will take to complete the purchase of a new system. Stretch outs force us below economic production rates and therefore increase the unit cost of each new system. Thus, in the long run a new system will cost us more. During last year's and this year's budget preparations, we have avoided stretch outs by terminating many existing programs earlier than planned and by deferring the start of numerous new purchases. However, we are now at the point where cuts to our 2 percent real-growth proposal could result in costly stretch outs in essential programs.

The complexity and tradeoffs of defense budget decisionmaking are apparent when one considers the four components that define the combat capability of our armed forces:

- *Readiness:* the ability of forces, units, weapon systems, and equipment to achieve the results for which they were designed. It includes the ability to deploy and go into combat without unacceptable delays. Factors determining readiness include: the quality, training, and manning levels of military personnel; the condition and maintenance of equip-

ment; the state of collective training of units and crews; the quality of command, control, communications, and intelligence (C^3I) support; the location and mobility of forces; and logistics support.

- *Sustainability:* the "staying power" of our personnel, units, weapon systems, and equipment, which is often measured in numbers of days. It is determined by our stockpiles of munitions, repair parts, fuel, and other necessities, and by the vitality of our defense industrial base.

- *Modernization:* the technical sophistication of forces, units, weapon systems, and equipment. By incorporating the latest technology and drawing on lessons learned from systems already in service, modernized systems typically provide improvements in speed, accuracy, lethality, survivability, flexibility, maintainability, and other features that can help our forces fight effectively.

- *Force Structure:* the numbers, size, and composition of the units in our defense forces; e.g., divisions, ships, air wings, etc.

In the face of ongoing severe constraints on America's defense budget, our priority should be to ensure a high state of readiness and to maintain adequate levels of sustainability and modernization, even

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at the expense of carefully considered force structure reductions. Our goal must be a balanced defense posture. While adhering to sound priorities, we also must rigorously determine which specific programs offer the greatest payoff for our overall defense posture.

As discussed above, the combat capability of America's armed forces is determined by many more factors than just the *number* of tanks, ships, planes, and other weapons in our inventory. Our strength depends on what our weapons can do: their accuracy, speed, firepower, etc. Yet some critics continue to use numbers as their prime criteria for judging our defense progress. Some lament that for all our 1980s defense spending, our forces have not increased in size commensurately. Others note that -- for a given amount of money -- we are buying fewer tanks, ships, and planes, for example, than in the 1960s. The flaw in these charges is that they do not acknowledge that a 1980s-vintage weapon system greatly outperforms the 1960s-vintage system it replaces. For example:

- The U.S. Army's Bradley fighting vehicle costs more in real dollars than the M113 armored personnel carrier it replaces, but the Bradley is far more capable. Equipped with the Bradley, our infantry companies can accomplish many previously unattainable tasks such as: keeping up with and fighting in concert with attacking tanks; effectively engaging enemy armor at long range; firing individual weapons while mounted; and remaining better protected inside the vehicle, thanks to its greater speed and innovative design features.

- The U.S. Navy's Aegis antiair warfare (AAW) system provides a dramatic increase in the firepower, area coverage, and simultaneous missile control capability of our newest surface combatants, particularly in comparison with older AAW ships now being retired. As detailed in Chapter III.B, by the early 1990s this system will provide nearly a five-fold increase in AAW firepower over our 1980 capability.

- The U.S. Air Force's new LANTIRN system will enable our tactical aircraft to operate effectively at night and during reduced visibility. Consequently, our defense capabilities in Europe, for example, will be much more effective in bad weather and in the short days of winter.

These are but a few examples of what America's defense dollars are buying -- namely quality and effectiveness. The technological sophistication we are achieving can spell the difference between success and failure -- for example, in detecting any enemy attacker before being detected, or hitting a target before becoming a target.

In sum, top quality people paired with advanced weapons remain the best formula for U.S. security, no less so in these times of severe budget pressures. It is also a formula that, if followed, can draw on America's inherent strengths, and therefore offers the greatest chance of success.

5. Stretching America's Defense Dollars

Every year -- regardless of budget levels -- we strive to achieve the maximum possible value from every defense dollar. In the coming years, however, the consequences of falling short of that goal will be greater than ever. The real decreases in our defense budget are requiring us to cut into military muscle, increasing our security risks toward unacceptable levels. Still, this does not mean that we cannot save money. Clearly we can, primarily by correcting systemic flaws in our DoD-Congress-Industry process of buying weapons. To stretch defense dollars significantly, we must attack the fundamental inefficiencies in our overall defense acquisition/budget process.

The greatest obstacle to higher defense output is instability in individual military programs and in the overall defense budget. When funding beyond the current fiscal year is uncertain, effective planning and long-term investment are difficult, if not impossible to achieve. Only with stability can long-range investments, such as research and productivity enhancement, be made with confidence that they will pay off.

One way to achieve greater stability would be for the Congress to join DoD in shifting to a biennial defense budget. Additionally, the Congress should approve our proposals to fund many more defense programs on a multiyear basis. The possible economies are significant: from FY 1982 through FY 1989, approved multiyear procurement programs will produce savings of over $9 billion.

We also can achieve stability and savings by streamlining our defense acquisition system and the budget process that supports it. In DoD, we already are making progress toward that goal with a less cumbersome, less complex process under the leadership of our Under Secretary of Defense for Acquisition. Our actions include the elimination of unnecessary regulations and specifications, and the freezing of weapons designs at an appropriate time in the acquisition process to avoid costly, open-ended upgrades. We are, however, approaching the limit of what we can achieve without congressional help.

The most formidable obstacle to streamlining and stabilizing our defense acquisition/budget process is what I term "intervention points." These are steps in

the process when outside influences can intervene. For example, each of the annual budget reviews by the House and Senate authorization and appropriations committees is an intervention point. Year after year, a program -- say, procurement of the Army's M1 tank -- is subject to congressional changes in the quantity purchased and other constraints, such as when the Congress prohibited the Army from seeking a competitive producer of the M1 tank engine.

By reducing these intervention points, especially after a program has been debated and endorsed in the Congress, we could stretch our defense dollars and reduce the likelihood that special interests would overrule sound defense decisions. Our goal must be to identify our military requirements and necessary systems early in the process, then agree upon an appropriate schedule for procurement and stick to it, unless complications require changes. This could yield substantial savings. If we could bring genuine stability to our defense acquisition/budget process, I am confident that we could save *$10 billion or more a year*. Chapters II.A and II.B offer a more detailed discussion on defense acquisition and budget reform, but the foundation of all our reform efforts must be stability and reduced political intervention. We must have a more streamlined, less complex process -- one promoting timely and sound decisions that are not forever hostage to change.

For efficient defense spending, we also must allow our managers to manage. Members of Congress should stick to making major defense resource decisions, while holding DoD officials responsible for executing those decisions. Except when clearly justified, the Congress should resist intervening in manager-level activities. Such intervention undoubtedly is behind many of the more than 600 reports required of this Department by the 100th Congress. This is the path to a truly significant savings for America's defense budget, a path we forsake at the cost of jeopardizing our nation's security.

6. Looking Ahead

As outlined in this report, there are important defense decisions ahead for a new congress and new president. Even though the global picture looks brighter, for America and our allies security will require continued vigilance and financial investment. We must sustain the military basis of our success as long as potentially hostile military forces threaten our vital interests.

Though sacrifices still face us, we should be encouraged by the long-range prospect for our cause. Ultimately the security of free nations rests on the distinctive advantages of our societies. Yes, the foundation of our security will continue to be our military strength. But that in turn derives from the broader strengths of our nations, especially:

- The unshakable resolve of our citizens to devote a sufficient share of their economic output to defense;

- The economic vitality of our societies, which produces the wealth and goods to sustain an adequate defense posture;

- The sophistication and pace of our technological progress, because the key to our defense will continue to be the quality and superior capabilities of our forces; and

- Our defense industrial base, especially our manufacturing and skilled workers, engineers, etc.

The dynamism of free societies gives us an advantage in achieving these societal building blocks. But our freedom also leaves us free to neglect them. Thus, ultimately the security of a free society rests with its people, which is as it ought to be.

Today evidence abounds that open societies can remain secure and that freedom may yet reach peoples now repressed. But success will require vision and sacrifice, just as it has in the past. If we choose wisely, we can shape a better world for all peoples.

B. THREATS, MILITARY BALANCES, AND NET ASSESSMENTS

1. Threats to U.S. Security

a. *The Soviet Union*

The changes taking place in the Soviet Union today inspire widespread hopes that the international environment is becoming safer. While we should not fail to acknowledge and encourage the developments that foster this optimism, hope alone is a poor guide to policy. We must cautiously assess the threats to our security, not in light of professions of intent or interpretations of future tendencies, but primarily in terms of the balance of capabilities of the military forces maintained by ourselves, our allies, and our potential enemies. In the sections that follow, military balance assessments are presented for major regional and functional areas.

Our ability to understand, let alone influence, future Soviet policy is limited; but we should observe that recent encouraging changes in the Soviet Union have coincided with American policies that reflected our determination to do what is necessary to protect our security. When I spoke last August at the Voroshilov Military Academy in Moscow, I posed three questions about the future of Soviet military policy:

- Will *glasnost*, or openness, ease the secrecy surrounding the Soviet military as it has begun to do in other aspects of Soviet life?

- Will *perestroika*, or restructuring, result in a redirection of resources away from military production and toward civilian needs? and

- Will the Soviets' "new thinking" about foreign policy -- supposedly emphasizing political and cooperative approaches -- result in a restructuring of Soviet military doctrine and force structure, and lasting changes in the way the Soviet Union conducts its relations with other nations?

These questions remain, for the most part, unanswered. *Glasnost* has permitted more public discussion of Soviet military policy than we have seen in the past, but we do not know whether the more moderate positions expressed are supported by decisionmakers. Although I and others have visited some Soviet military installations, Soviet military plans and intentions in general remain closely guarded secrets. The Soviets have promised to publish accurate military budget figures, but meanwhile our intelligence estimates show Soviet military expenditures many times higher than the announced Soviet defense budget, and those expenditures appear to have grown quite steadily since Gorbachev came to power. Gorbachev's 7 December speech promises significant reductions in the manpower and equipment levels of Soviet active forces, freeing some resources over the next two years for other purposes. Nevertheless, a more significant shift toward Gorbachev's goal of economic modernization would require reductions in Soviet weapons production and research efforts which have not yet been promised by Gorbachev.

Several elements of Soviet foreign policy, however, offer grounds for hope. The announced Soviet intention to withdraw all their combat forces from Afghanistan is most welcome, as is the successful conclusion of the INF Treaty and professed Soviet interest in reducing strategic and conventional forces. In a joint declaration with Yugoslavia, the Soviet Union has renounced "any threat or use of force and interference in the internal affairs of other states under any pretext whatsoever." In his U.N. speech, Gorbachev spoke of the "multi-optional nature of social development in different countries" and said that "the use or threat of force can no longer and must no longer be an instrument of foreign policy." If these principles are followed, they would constitute a radical departure from past Soviet policies toward Eastern Europe. Other Soviet statements, however, leave room for doubt, and future Soviet behavior toward Eastern Europe remains uncertain. Revealingly, recent Soviet activities elsewhere include air attacks against Pakistan; naval facilities construction at Tartus, Syria; support for Cuban forces in Angola, Ethiopia, and Mozambique; significant military assistance to Nicaragua's Marxist regime; and transfers of advanced MiG-29 fighter aircraft and SA-5 surface-to-air missiles (SAMs) to North Korea. These activities raise questions about the real meaning and influence of Soviet "new thinking" on their foreign policy.

Soviet statements suggesting a new standard of "reasonable sufficiency" in sizing their military forces, and a new doctrine of "defensive defense" for military operations, are particularly interesting. These phrases convey the sense that the Soviets plan a less expensive and less threatening military posture, but their real meaning is unclear and subject to different interpretations within the Soviet Union. These statements of *intent*, moreover, do not alter Soviet military *capabilities* that constitute the threat to our nation's and our allies' security. We must be capable of countering Soviet capabilities until such time, if ever, as they cease to pose a significant threat to our security. Indeed, in some Soviet military writings, "sufficiency" is described as

long-standing Soviet policy, while "defensive defense" includes a capability for "counteroffensives," i.e., a capability for large-scale offensive military operations. While Gorbachev's announced cuts in tank forces over the next two years suggest that military "sufficiency" is compatible with Soviet reductions, these announced reductions, if carried out, will reduce but not come close to eliminating Warsaw Pact advantages over NATO.

b. The Future of the Soviet Threat

As we look to the future, several factors will shape the Soviet military threat. First, Soviet military writers foresee a revolution in military affairs resulting from the application of emerging technologies. Advances in microelectronics, telecommunications, and munitions lethality are expected to permit extremely rapid, accurate, and destructive nonnuclear attacks by unmanned systems operating from very long ranges. Such capabilities could extend the battlefield far beyond the front lines and deep into combatants' homelands. The result could be attacks with effects as decisive as those previously attributed only to nuclear weapons. In the longer term, space-based systems and weapons based on "new physical principles" (e.g., directed energy) are expected to play a dominant role. Soviet writings suggest that military exploitation of the new technologies will require entirely new modes of organization and operational concepts.

Second, the Soviet economic system's difficulties may eventually constrain the expansion of Soviet military efforts, and may compromise the Soviets' ability to produce the technologically advanced systems that they believe will be of central importance to the future military balance. The large share of the Soviet economy devoted to military purposes is an important contributor to the economic stagnation that Gorbachev is seeking to remedy. Soviet economic rejuvenation may be necessary to Moscow's ability to maintain the military advantages accrued over the past several decades. Concerns about the West's relative economic strength also give the Soviet Union a strong incentive to find ways to restrain the West's exploitation of advanced military technologies.

Third, for the foreseeable future there will be great uncertainty about Soviet intentions. The current Soviet leadership's ultimate objectives are known only to them, and the duration of their authority is uncertain. Furthermore, the Soviet regime is inherently capable of sudden policy shifts. A prudent American policy must hedge against a wide range of uncertainty concerning future Soviet actions.

c. Other Threats to U.S. National Interests

No other nation poses a military threat to the United States and its allies even remotely comparable to that posed by Soviet forces. Still, there are a number of "lesser" threats that forces designed against the largest threats are not necessarily equipped to deal with. In some cases, the threat to U.S. interests posed by "low-intensity conflicts" raises concerns that such conflicts will result in a geographical extension of Soviet military power. In other cases, our interests are at stake even if the Soviet Union is not involved.

Direct Soviet aggression against the United States and its allies is the "worst-case" threat to U.S. and allied security. Low-intensity conflict, however, has been the most common form of conflict for the United States in the post-World War II era. Such conflict -- in the form of insurgency, terrorism, and subversion -- threatens U.S. interests around the globe. For example:

- Our military basing, access, and transit rights in the Philippines, which are key to our power-projection capabilities in the western Pacific, northeast Asia, and the Indian Ocean, are presently threatened by the communist insurgency being waged against the Philippine government.

- In southern Africa, insurgencies, economic instability, and apartheid are potential threats to the region's supply of raw materials vital to civilian and defense industries in the West and Japan.

- Insurgencies in El Salvador and elsewhere in Latin America, supported by the Soviet Union, Cuba, and Nicaragua, could threaten U.S. access to the Panama Canal and military facilities in the region, as well as the stability of nascent Latin American democracies.

- Libya trains terrorists on its soil while providing support to subversive, opposition, and terrorist groups worldwide.

- The linkage between terrorism, insurgency, and drug trafficking in this hemisphere threatens to subvert entire governments.

The proliferation of chemical and nuclear warheads, as well as modern delivery systems, threatens to make so-called low-intensity conflicts very destructive, and constitutes a potential threat to our allies and military forces abroad. The Soviet Union finally acknowledged last year that it possesses chemical weapons, and about 20 other nations also have them or the means to produce them. Furthermore, many of them also have, or will soon have, ballistic missiles able to deliver

chemical and biological warheads. Many of these countries are not friends of the United States; some have unstable leadership. In fact, a Third World conflict may be the most likely scenario for a chemical or biological attack on U.S. forces.

d. Future Threats

I have already touched on several aspects of the future security environment likely to confront the United States: the proliferation of high technology weapons and high lethality weapons, including ballistic missiles and chemical and nuclear warheads, to a wider range of countries; and the impending revolutionary effects of new military technologies. Generally speaking, the international system will become increasingly multipolar over the next several decades, as relatively rapid economic growth in China, Japan, and other countries increases their international importance and, potentially, their military power. This development does not constitute the "decline" of America. We have no wish to restrain the prosperity of other nations, and indeed seek to promote their prosperity by mutually advantageous trade. Economic competition does not constitute a threat to our security if, as appears likely, the strongest competitors are countries with democratic governments and free market economies, which share common interests with the United States.

The diffusion of power and advanced weaponry, however, is already posing new dangers, and this trend will likely continue in the future. Countries hostile to the United States will almost certainly acquire more lethal weapon systems. This will not allow them rationally to contemplate direct conflict with us, but it may support limited, ambiguous provocations that we must be prepared to counter. Moreover, the damage wrought by low-intensity conflict could become extremely great in the future. Thus, in designing our future strategy and force structure to counter Soviet military developments, the United States must also be capable of discouraging other emerging threats to freedom and peace.

2. The Strategic Nuclear Balance

An assessment of the strategic nuclear balance cannot be limited to a comparison of the numbers and destructive capabilities of U.S. and Soviet offensive nuclear forces. Trends in force development, doctrine for force employment, asymmetries between the possible targets of the two sides' forces, and above all, asymmetries in the active and passive defenses of each side must be taken into account. In particular, we must understand how the Soviets assess the strategic balance, since their assessment, not ours, will determine whether Soviet aggression is deterred.

There are several fundamental dissimilarities between U.S. and Soviet nuclear force postures. First, the Soviet Union has made far more extensive preparations to conduct nuclear warfare than has the United States. While recognizing the great destructiveness of nuclear war, the Soviets appear to believe that well-timed offensive strikes and nationwide defensive measures can mitigate the consequences of a U.S. nuclear retaliatory strike. Second, the Soviet Union has fielded nuclear forces suitable for a first strike against U.S. land-based missiles; i.e., heavy silo-based ICBMs that carry multiple independently targetable reentry vehicles (MIRVs). Such forces are consistent with the Soviet objective to limit damage to themselves in a nuclear war by striking first if they expect an attack.

Some recent Soviet writings seem to propose a shift away from Soviet preemptive doctrine. While we would welcome such a shift, we have as yet seen no evidence of corresponding changes in Soviet operational practice or force structure. While the Soviet Union maintains a large advantage in heavy ICBMs, which offer a prompt, hard-target-kill capability, the United States maintains superior capabilities in submarine and bomber forces. We have sought to maintain a capability to hold at risk those assets the Soviets value most for achieving their wartime objectives.

a. Strategic Offensive Forces

The U.S. strategic modernization program is increasing the capability and survivability of our offensive forces. The deployment of a limited, 50-missile Peacekeeper force reduces the Soviet advantage in prompt, hard-target-kill capability (PHTK), although the Soviet lead in ICBM systems remains (see Chart I.B.1). Our Ohio-class SSBNs armed with Trident I SLBMs, B-1B bombers, and air-launched cruise missiles (ALCMs) -- possessing greater survivability, accuracy, and effectiveness than older systems -- will preserve our advantages in submarines and bombers.

Longer-term projections of the balance depend, in part, on how the uncertainty surrounding the modernization of the U.S. ICBM force is resolved. Planned U.S. mobile ICBMs provide increased survivability and can hold hardened targets at risk, but we have not yet deployed them. The accurate Trident II SLBM also will, for the first time, enable the SSBN force to hold at risk hardened Soviet targets, while the penetration capability and operational flexibility of our B-2 Bomber and Advanced Cruise Missile (ACM) will significantly stress Soviet air defenses and maintain the effectiveness of our airbreathing forces. Improvements to our command, control and communications systems will continue to make a Soviet surprise or preemptive attack against our command system unattractive, and

U.S.-Soviet ICBM Reentry Vehicles (RVs) Deployed (1981 - 1988)

Chart I.B.1
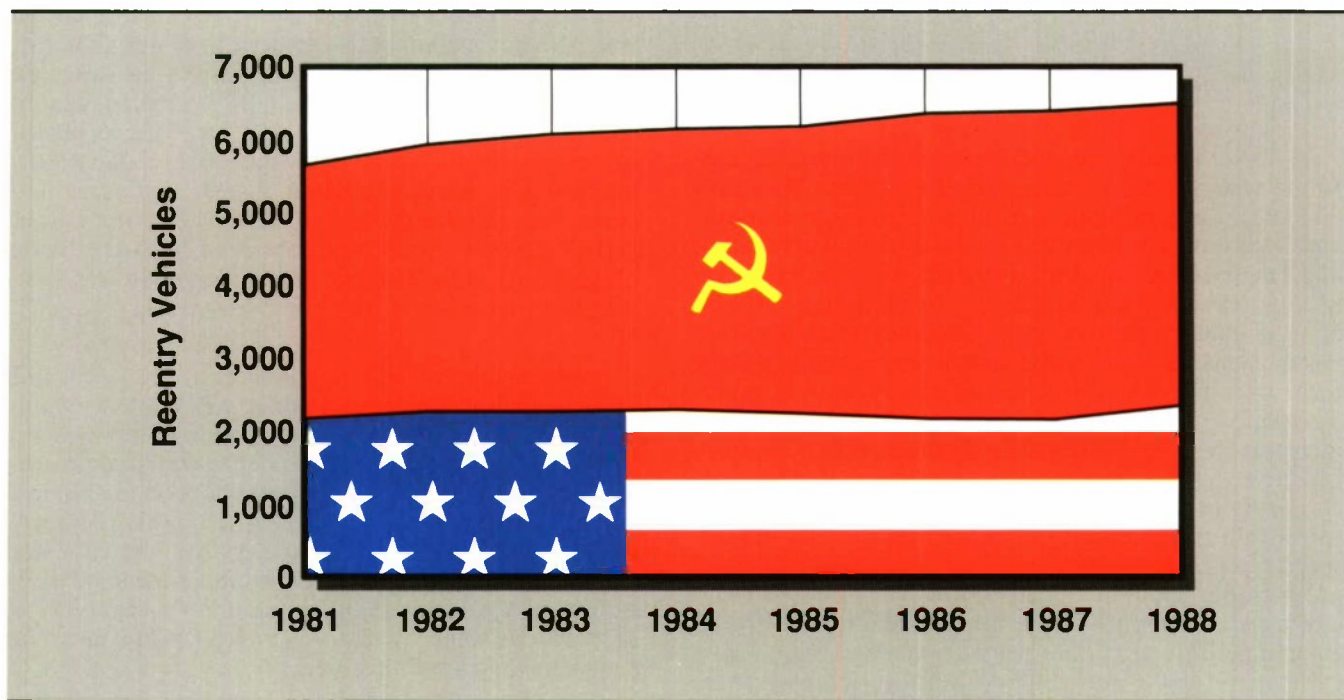
provide an improved capability to manage our forces in demanding contingencies.

The Soviets are seeking to increase their advantage in PHTK capability while improving the survivability and operational flexibility of their offensive forces. For example, the Soviets have recently deployed two mobile ICBMs -- the SS-25 and SS-24. They also are modernizing their silo-based heavy SS-18 ICBM force, indicating a continuing preference for a preemptive first-strike capability. Their modern Typhoon and Delta IV submarines, armed with more accurate MIRVed SS-N-20 and SS-N-23 SLBMs, and defended by Soviet naval and air assets, have enhanced significantly Moscow's strategic posture and have increased the role SSBNs play in Soviet strategic planning (see Chart I.B.2). This role will continue to grow in the future as these SLBMs acquire the capability to attack hardened U.S. targets.

Indicative of the apparent open-ended and comprehensive Soviet strategic modernization effort are their new Bear-H and Blackjack bombers, and their AS-15 long-range air-launched cruise missiles (see Chart I.B.3). The growing role of the Soviet bomber force is evidenced in Bear-H training flights that simulate strikes against North America. In addition, the Soviets have deployed a sea-launched cruise missile (SLCM), the SS-N-21, and are developing a larger SLCM, the SS-NX-24, which has been flight tested

from a specially converted Yankee-class SSBN. The Soviets also are working on a new bomber-launched cruise missile.

b. Strategic Offensive Forces: Comparative Trends

As noted above, our modernization program seeks to maintain a robust deterrent by replacing old, often obsolescent systems, to offset partially the erosion of U.S. capabilities due to Soviet modernization. Soviet strategic forces were modernized in the late 1970s and early 1980s and remain more than sufficient for retaliatory purposes. The current SS-18 force alone is capable of destroying a large portion of our Minuteman silos, which represent nearly all of our hardened targets. The Soviets are enhancing their forces' flexibility and diversity by deploying more effective SSBN, SLBM, and bomber systems, while extending their advantage in ICBMs. They are also reducing the vulnerability of the assets they value most by deploying mobile systems, and by building and improving deep underground leadership protection facilities. This Soviet trend toward mobility, complemented by strategic defensive developments, may significantly alter the character of the targets they present to us, thereby complicating our ability to hold them at risk.

U.S.-Soviet SLBM Reentry Vehicles (RVs) Deployed
(1981 - 1988)

Chart I.B.2
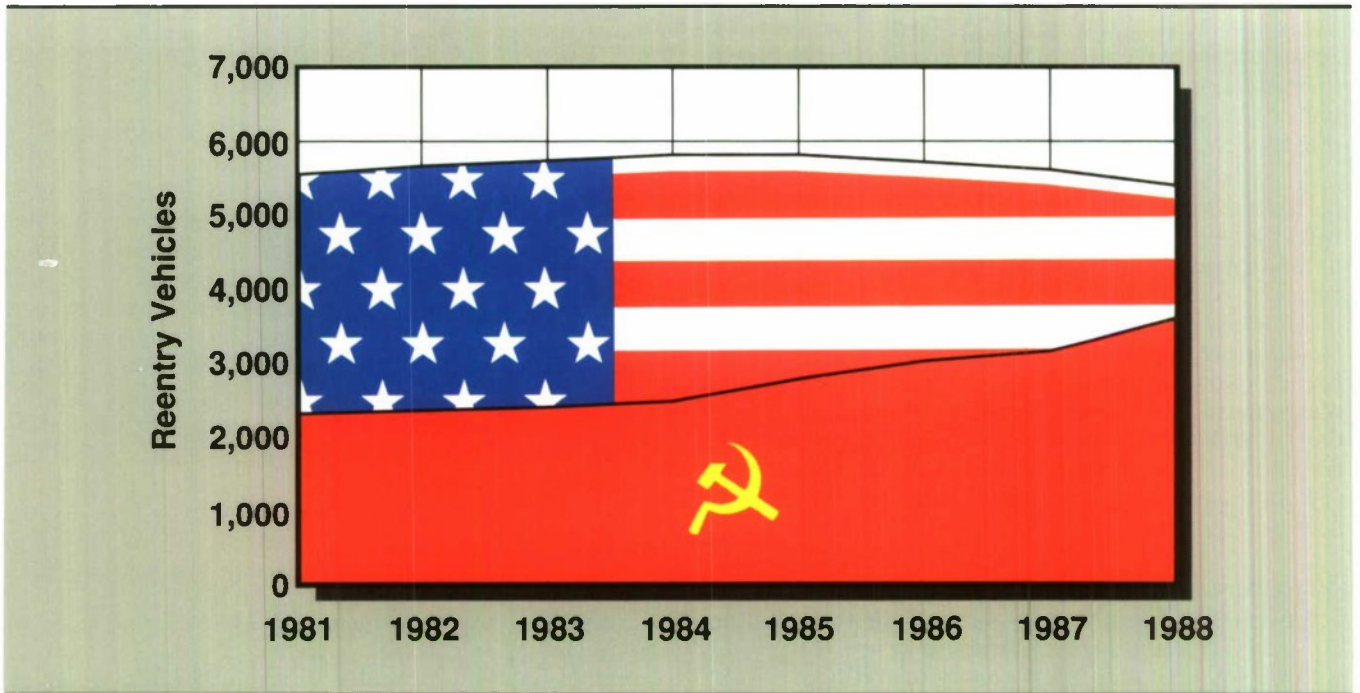
U.S. - Soviet Intercontinental - Capable Bombers*

Chart I.B.3
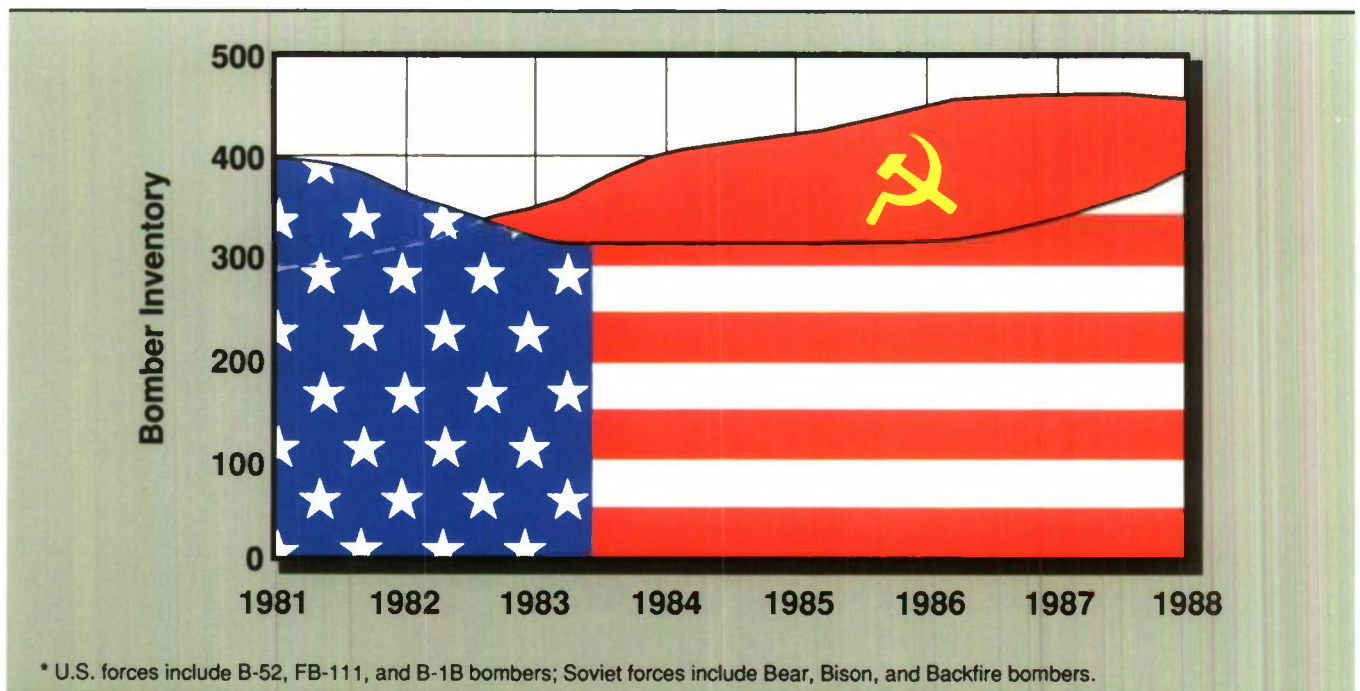
* U.S. forces include B-52, FB-111, and B-1B bombers; Soviet forces include Bear, Bison, and Backfire bombers.

c. Strategic Defensive Forces

There are profound asymmetries in U.S. and Soviet strategic defenses. Our air defenses are designed primarily to provide warning of an attack, whereas the Soviet air defenses provide both warning and a degree of protection. Furthermore, our civil defense efforts, unlike the Soviets', are very limited and our industrial preparation for war is lacking.

Soviet active and passive defensive measures are wide-ranging and expensive. Passive measures include numerous deep and near-surface underground facilities designed to withstand nuclear attack and protect the bulk of Soviet civilian and military leadership. These facilities are supported by a complex system of hardened, redundant, and mobile command, control, and communications systems to assure centralized control during and after nuclear war. Industrial preparations for nuclear war appear to continue, at considerable cost to an economy that needs resources for modernization.

Continued large-scale Soviet investments in active defenses (see Chart I.B.4) underscore this cardinal U.S.-Soviet asymmetry. Deployment of Soviet advanced fighters and SAMs, and operational refinements have increased their air defense network's effectiveness. In the aggregate, the Soviet Union's

ABM and ABM-related actions suggest that Moscow may be preparing an ABM defense of its national territory. These actions include constructing an interlocking network of new large phased-array radars (including the Krasnoyarsk facility); radar construction; concurrent testing; SAM upgrade; and an ABM rapid reload capability.

As the Soviets have admitted, their advanced research into ballistic missile defenses covers many of the areas examined by our Strategic Defense Initiative (SDI). I want to emphasize that the Soviet effort predates SDI and is far more comprehensive and expensive. Soviet research and development (R&D) in high-energy lasers, particle beams, kinetic energy, and radio frequency weapons is directed at investigating operational ASAT and ballistic missile defense (BMD) concepts and capabilities. In some cases Soviet activity has gone beyond laboratory research, as attested by their ground-based lasers which have some capability to attack U.S. satellites.

d. Summary

Overall, our assessment of the strategic nuclear balance indicates that U.S. nuclear forces are, and will remain for the foreseeable future, capable of deterring an attack against ourselves, and will credibly supplement our forward-deployed forces in deterring attacks

A Comparison of U.S. Strategic Defense Procurement Expenditures with the Estimated Dollar Cost of Soviet Strategic Defense Procurement Expenditures

Chart I.B.4

$90 Billion Cumulative Difference
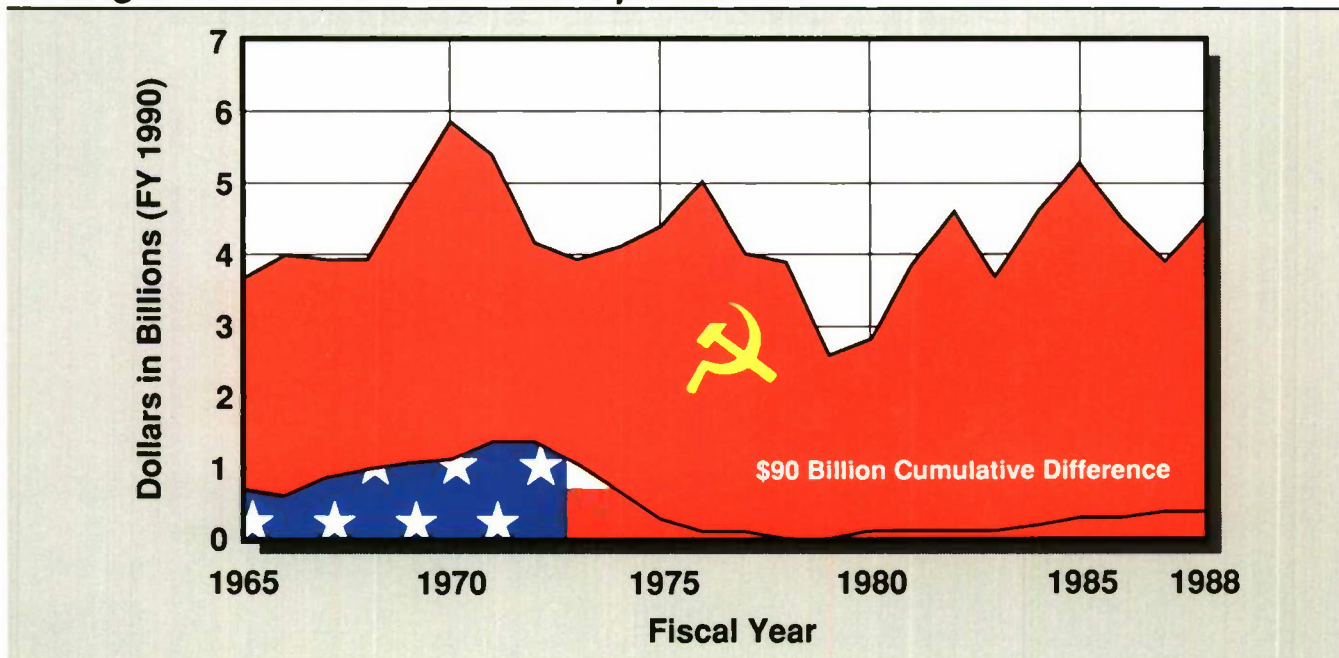
against our allies. We believe that a Soviet assessment of the balance would reach the same conclusion.

In the coming years, the strategic nuclear balance will be shaped by the trend toward increasingly accurate ballistic and cruise missiles; major changes in the nature of the targets; the growing role of the Soviet SSBN force; and the potential for a far more effective U.S. bomber force. While the increasing accuracy of offensive systems has eroded the survivability of most fixed targets, Soviet efforts to maintain survivability through mobility and deep underground facilities challenge our ability to hold key Soviet assets at risk. Our lack of mobile ICBMs and passive defense facilities contributes to a growing asymmetry in comparative U.S.-Soviet ability to target important national assets. Furthermore, while our SSBN force will remain survivable and become even more effective, the increasing survivability of Soviet SSBNs and the growing accuracy of their SLBMs will narrow our advantage in sea-based forces. Despite the rejuvenation of the Soviet bomber force, the successful completion of the B-2 and the ACM programs should ensure our advantage in bombers over the foreseeable future. The projected survivability of these low observable systems could increase our ability to hold a wider array of Soviet targets at risk.

The asymmetry in U.S.-Soviet strategic defenses is projected to increase in the future. While an SDI deployment remains some years away, Soviet strategic offensive and defensive improvements could, collectively, tilt the strategic balance in Moscow's favor. Consequently, maintaining deterrence appears to depend largely on a balanced development of our strategic offensive and defensive capabilities to deny the Soviet leadership any illusion that they could achieve their war objectives.

3. The Military Space Balance

The United States and its allies currently enjoy some specific advantages over the Soviet Union and its allies in national security space capabilities, although there are several major asymmetries. These advantages are critical to our national security because they are essential in offsetting the Soviets' quantitative superiority in air-ground-sea forces. The Soviet Union's space objectives are to attain and maintain military superiority in outer space; deny the use of space to other nations; and assure maximum space-based military support for Soviet offensive and defensive combat operations on land, at sea, in the air, and in space. Indeed, at least 90 percent of the Soviet Union's space program is devoted to military or military-related purposes, and their space programs are allocated resources at a high, stable rate.

a. Soviet Space Infrastructure

Over the past three decades the Soviet Union has steadily improved its military space capabilities. Current Soviet space launch capabilities are impressive. During the five-year period from 1983 through 1987, for example, the Soviets averaged over 90 space operations per year, with an annual average of about 116 payloads placed in orbit. The Soviet launch success rate was over 90 percent. The corresponding numbers for the United States are approximately 16 launch operations per year, 23 payloads boosted in orbit per year, and a success rate of approximately 90 percent. While this difference is in many respects driven by the shorter lives of many Soviet space systems, the Soviet level of launch activity (over five times that of the United States, with the same or better reliability) does provide them with a high degree of responsiveness which would serve them well during times of crisis. Furthermore, Soviet turnaround time between launches -- measured in hours or a few days -- is more suited for wartime than the U.S. turnaround time of several weeks or even months. Additionally, the Soviets manufacture and stockpile satellites and boosters that will allow them to reconstitute quickly their on-orbit space assets to meet their military needs in time of war. The impressive diversity and depth of the Soviet launch vehicle inventory is shown in Chart 1.B.5.

If we examine payload weight-to-orbit for the past decade, the Soviet average is more than double that of the United States. This disparity will increase greatly over the next decade if the United States does not embark on a new launch vehicle development effort. It is estimated that by the year 2000, the Soviet Union will be capable of placing nearly three million pounds of payload in orbit per year. That estimate is based on existing Soviet launch systems and projected launch rates. We know, for example, that the Soviets have built their SL-X-17 "Energiya" launch pads with huge dimensions, sufficient to accommodate a much larger vehicle. While single-vehicle launch capacity is not the only index of capability, it provides some indication of future potential, especially for deploying large objects and, possibly, advanced weapons. Chart 1.B.6 compares U.S. and Soviet launch capacity to the year 2005 in terms of weight-to-orbit.

Finally, the Soviets man year-round a space station where personnel conduct a variety of military and scientific experiments. This gives them an opportunity to gain vast amounts of man-in-space experience that could support military operations.

Soviet Space Launch Vehicles

Chart I.B.5

Operational — Undergoing Flight Testing

SL-4[a]	SL-6[a]	SL-8[a]	SL-11[a]	SL-12	SL-13	SL-14[a]	SL-16	Reusable Space Plane In Development	SHUTTLE	SL-X-17
7,500	2,100[c]	1,700	4,000	2,000[c]	19,500	5,500	15,000+		30,000	100,000+

Meters (y-axis: 0, 20, 40, 60)

Payload to 185 KM (KG)[b]

[a] Ballistic Missile Derived.   [b] Approximate.   [c] Height Approximate.
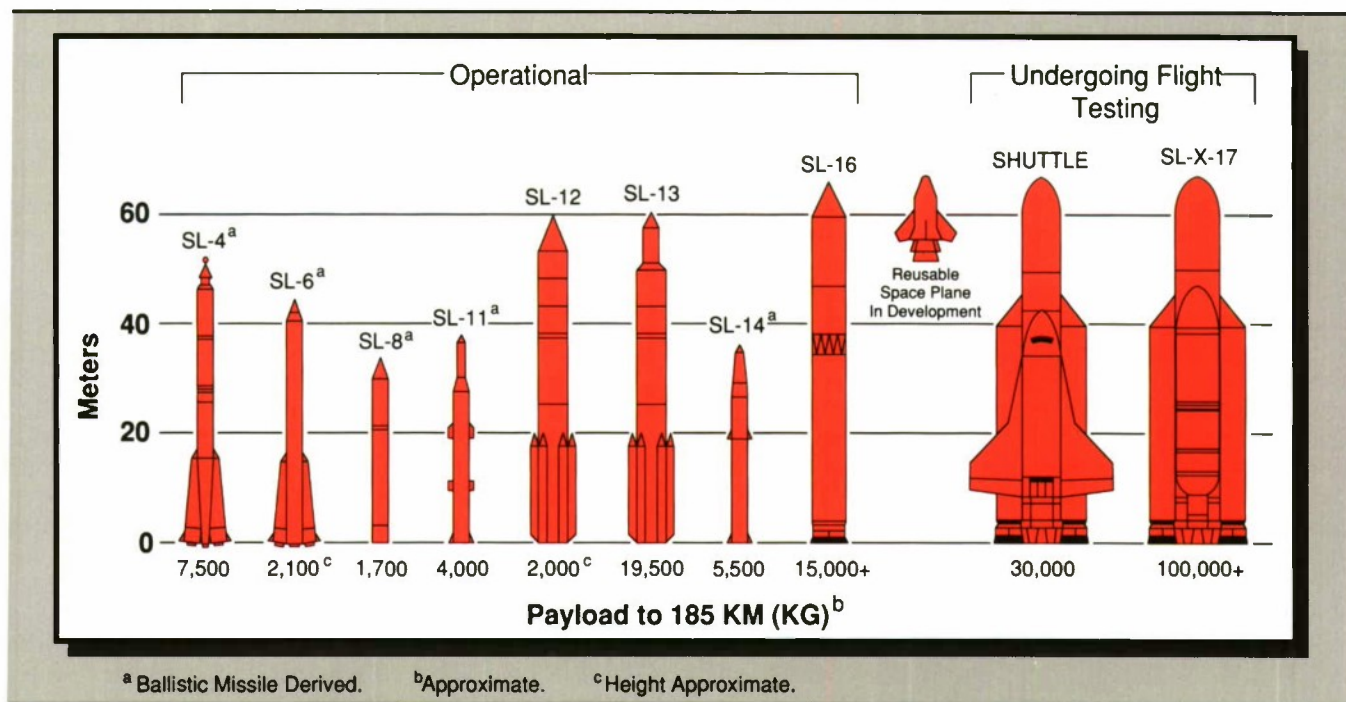
Soviet vs. U.S. Weight-to-Orbit

Chart I.B.6

Millions of Kilograms (y-axis: 0, 0.5, 1.0, 1.5, 2.0)

Actual | Projected

Estimated Soviet Capability

Currently Identified U.S. Needs

Currently Programmed U.S. Capability

Estimated Soviet Capabilities

U.S. Capabilities

Fiscal Year (x-axis: 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005)
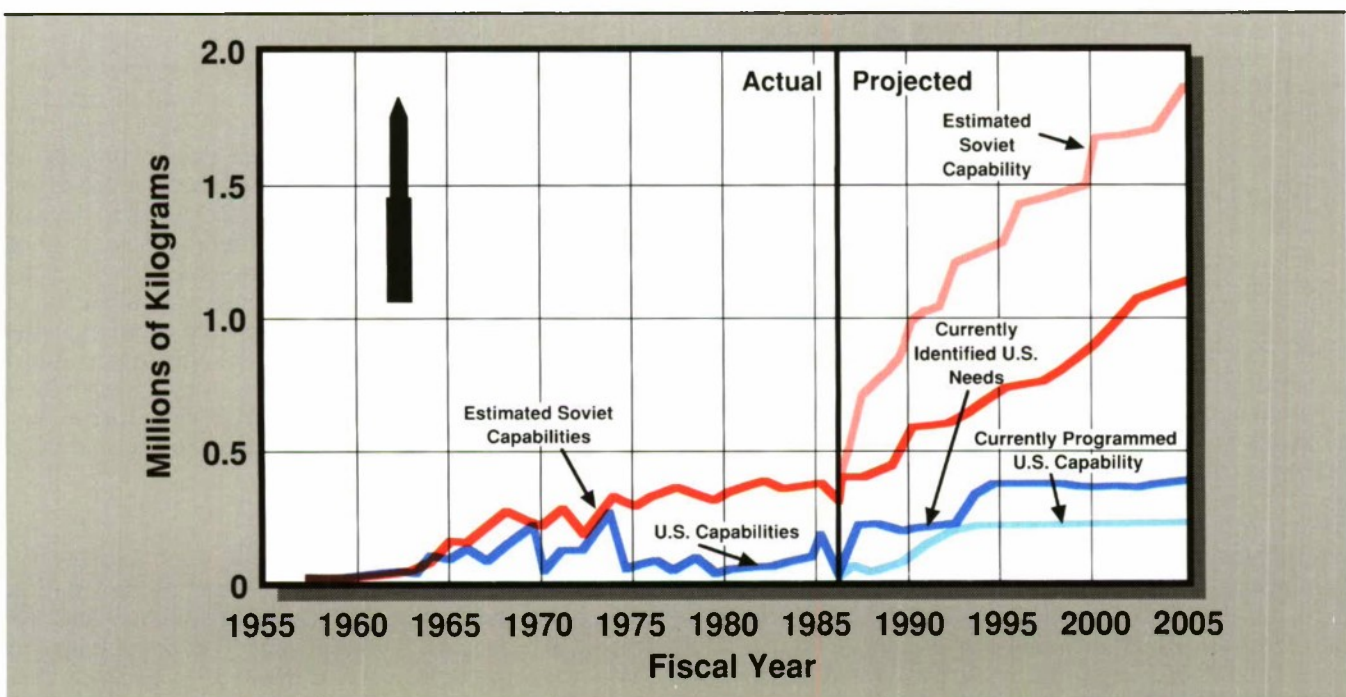
b. Threats to U.S. and Allied Terrestrial Forces

There are considerable asymmetries in U.S. and Soviet military space infrastructures. Last year we conducted a comprehensive net assessment of U.S. and Soviet space capabilities to assess these asymmetries. We concluded that while U.S. space systems are superior in performance and on-orbit endurance, the Soviets possess some considerable advantages in warfighting capability. Their strength is evident in two areas: antisatellite capability, and ability to surge or reconstitute rapidly and thus increase performance in crisis or war.

Soviet systems, including launch capability and reconstitution of space assets, are prioritized for wartime operations. Our analysis of their current development programs indicates that their wartime military space capability is likely to increase substantially over the next five-to-ten years. New Soviet space systems will enhance support for their terrestrial forces while posing significantly greater threats to our forces. For example, they may be able to provide targeting information on our seaborne reinforcements as well as forces operating on land.

c. The Soviet ASAT Threat

At present, the Soviets possess the world's only operational antisatellite (ASAT) system. Their system has been operational since the early 1970s, but has not been launched for several years. Contrary to what has been stated by some, this system is reliable and effective, and poses a direct threat to our low-earth orbit satellites. The Intelligence Community has conclusive evidence that the Soviets maintain their operational co-orbital ASAT capabilities in a constant state of readiness. In addition, Soviet Galosh ABM interceptors deployed around Moscow and some of the lasers located at the Sary Shagan Test Center have ASAT potential, as do certain Soviet electronic warfare capabilities. During the next decade, the Soviets are expected to move aggressively in developing advanced ASAT systems based on kinetic and directed-energy technologies, possibly including radio-frequency weapons.

These ASAT capabilities provide the Soviets with the capacity to degrade the performance of our satellites and those of our allies in a crisis or conflict, and to destroy many of our critical satellites as the crisis or conflict worsens. With the effectiveness of U.S. and allied terrestrial forces heavily dependent on space systems support, the Soviets will have a great incentive to degrade or destroy our space assets. This threat will be especially serious if the United States lacks an effective ASAT capability to deter such attacks, or space systems that can endure and survive such attacks should they occur.

In summary, the Soviet Union has a clear advantage in the capacity and resiliency of its space launch capability and in manned space flight, and although Soviet space systems generally are less capable and shorter lived than their U.S. counterparts, they constitute a growing threat to our nuclear and conventional forces. The United States' advantages lie in its ability to build highly capable, technologically advanced satellites with on-orbit resiliency, which can better withstand an extended launch standdown, such as the one following the shuttle and other launch vehicle failures in 1986.

4. The NATO-Warsaw Pact Balance

The military balance between the North Atlantic Treaty Organization (NATO) and the Warsaw Pact involves the full range of forces, from unconventional warfare forces, through conventional air, land, and naval forces, to nonstrategic and strategic nuclear forces. Superimposed on these forces are national and alliance command and control systems, operational doctrines, and logistics infrastructures and procedures. We assess the overall effectiveness of NATO's force posture by how well it serves NATO's objectives of deterring aggression and defending Western Europe should deterrence fail. One measure of the trends in this balance area is the production of military equipment and systems by the two sides. To date, we have yet to see any slackening in Warsaw Pact military production (see Chart 1.B.7). In fact, the Soviets appear to have in place the means to continue their current military production rate well into the 1990s. As a result, the Pact will maintain its quantitative advantage over NATO in most categories of weapons systems, and is positioned to hold that advantage for at least the next five years, even if reductions proposed by Chairman Gorbachev in his 7 December U.N. speech are implemented. Nevertheless, we applaud Gorbachev's announcement as recognition of what we have been saying for a number of years: that the Soviets have far more forces than they need for defensive purposes.

Even if Gorbachev carries out his proposal, however, the threat to Western security posed by the residual forces will remain significant. For example, while his proposal for a 500,000-man reduction amounts to roughly 10 percent of Soviet forces, it still leaves Moscow with around a 2:1 manpower advantage over the United States. Furthermore, his proposal for a reduction of 10,000 tanks and 8,500 artillery pieces in Europe and the European part of the U.S.S.R., while significant, would still leave the Warsaw Pact with an advantage over NATO of approximately 25,000 tanks

Production of Selected Weapons for NATO and Warsaw Pact Forces (1979-1988)

Chart I.B.7

Tanks
31,400 — 5,400 / 26,000
11,000 — 3,600 / 7,400

Other Armored Vehicles
54,300 — 6,300 / 48,000
20,800 — 9,500 / 11,300

Field Artillery, Mortars, and Rocket Launchers
31,500 — 6,500 / 25,000
5,800 — 2,600 / 3,200

Tactical Combat & Interceptor Aircraft
8,500 — 1,200 / 7,300
6,400 — 2,700 / 3,700

Major Surface Warships
106 — 23 / 83
175 — 94 / 81

Attack Submarines
66 — 2 / 64
59 — 26 / 33

Legend: Non-Soviet Warsaw Pact | Soviet Union | Non-U.S. NATO | United States

and 20,000 artillery pieces. Moreover, this quantitative advantage is accompanied by a modernization effort that is reducing the qualitative edge enjoyed by NATO.

In terms of nonstrategic nuclear forces (NSNF), the Pact maintains a better than 3:1 advantage over NATO in nuclear-capable, land-based aircraft in Central Europe, even though NATO has increased its forces slightly over the past eight years. On the other hand, over the same period the Pact has turned what was a slight NATO advantage in short-range nuclear-capable forces in Europe's Central Region into a significant Pact advantage. NATO's disadvantage in launchers is even more notable in view of its decision to make unilateral reductions totalling 2,400 warheads over the

past several years. Over the next several years, the Pact advantage in NSNF is projected to increase, notwithstanding the asymmetrical reductions that will result from the INF Treaty's elimination of ground-based launchers for missiles with ranges of 500 to 5,500 kilometers. While the ongoing elimination of systems like the SS-20, SS-23, and SS-12 is welcome, the Warsaw Pact still retains many more nuclear and conventionally armed short-range missiles than NATO.

Traditionally NATO has emphasized the quality of its air and naval forces, while the Pact has emphasized quantity. As a result, the Pact has increased its numerical advantage in air forces. Recently the Soviet modernization program has been producing aircraft like the

MiG-29 Fulcrum and Su-27 Flanker that are nearly as capable as NATO's front-line fighters, thereby eroding NATO's qualitative advantage. Fortunately, NATO's modernization program this decade has more than offset the Pact's gains. Consequently, the Pact's overall air force potential advantage has declined since its peak in the late 1970s.

Unfortunately, while NATO also has emphasized quality over quantity in its ground forces, it has not had the same success as with its air forces. In the main, this stems from the far larger number of ground forces produced and fielded by the Pact. Consequently, while NATO has maintained its qualitative advantage in in-place ground forces, the Pact's quantitative advantage has translated into an increase in ground force potential over NATO over the past two decades.

The quality and capabilities of NATO's naval forces may, under some circumstances, help to offset existing NATO ground and air force deficiencies. Under other circumstances, however, the lack of adequate strategic sealift and airlift may not allow us to reinforce NATO in a timely way, thereby according the Soviets a significant military advantage.

Equally important as the quantity and quality of forces is how the two sides intend to employ their forces operationally. NATO is a defensive alliance that is neither politically nor militarily capable of launching a surprise attack. It is inconceivable that NATO's 16 democratic nations would, or could, secretly agree to launch an attack on the Warsaw Pact; nor could NATO carry out such a surprise attack militarily. The Alliance does not have sufficient forces; the necessary stockpiles of ammunitions and fuel; the bridging equipment; the reinforcement capabilities; or the operational doctrine for a surprise attack. NATO is unmistakably a defensive alliance that is committed to deterrence first and to forward defense and flexible response should deterrence fail.

As for the Warsaw Pact, things are not so clear. They claim now to have adopted a defensive military doctrine, and Gorbachev has announced force structure reductions to take place over the next two years. Nevertheless the Soviet military describes their new "defensive" doctrine as having a strong counteroffensive component, and it is exceedingly difficult, if not impossible, to distinguish between a counteroffensive and a purely offensive capability. In fact, one could see how a counteroffensive force posture could be more robust, since it would be designed to absorb an initial attack before launching its offensive. While, as the Soviets promised, we have seen some exercises emphasizing defensive operations, until concrete force structure reductions are made to eliminate the Pact's asymmetric numerical advantages over NATO, we would be foolish

to assume their capabilities for offensive operations have diminished significantly.

Furthermore, the Pact continues to maintain, in forward areas, large stockpiles of engineer bridging equipment clearly intended to support offensive forces in river-crossing operations. In the area opposite NATO's Central Region, the Pact has doubled its storage capacity for ammunition and fuel over the past decade so that today it can support initial offensive operations without moving logistics stocks forward.

There also are indications that suggest the Soviets have become increasingly interested in how to fight and win a conventional-only war in Europe. In addition to modernizing its armored forces (tanks and infantry fighting vehicles), the Warsaw Pact has increased its field artillery over the past 10 years, to the point where they now enjoy a significant advantage over NATO forces. This is especially worrisome since the Warsaw Pact would rely heavily upon their field artillery in a conventional breakthrough attack. It is likely that the Soviets' interest in a nonnuclear option stems, at least in part, from their judgments concerning the severe and unacceptable consequences of nuclear weapons employment and nuclear escalation. At the same time, an all-out conventional war would be exceedingly complex to wage and critically dependent on successful timing.

The Soviets cannot be sure that a war with NATO would remain conventional, or that they could achieve their military objectives as rapidly as they desire. As a result, we judge that NATO's force posture is fulfilling its deterrent role. Nonetheless, should deterrence fail, we are concerned that Pact conventional force advantages could make NATO susceptible to a conventional defeat on the ground.

We see opportunities for NATO to improve its defense capability over the course of the next decade. Significant changes in military technology are resulting in conventional weapons with longer ranges and much greater accuracies than the current generation. Coupled with the increasing use of space for real-time surveillance, navigation, and secure communication, we are facing potentially revolutionary changes in the nature of warfare. NATO holds a comparative advantage over the Pact in a number of the technologies underlying these changes, such as microelectronics and computer capabilities.

In any case, decreasing military manpower pools in NATO countries will create even more incentive for us to continue moving to a less manpower-intensive force. These incentives are likely to be reinforced by continuing constraints on defense spending that force us to focus our efforts in a few key, high-leverage areas rath-

er than trying to improve significantly our capabilities across the board. These are the concepts at the heart of our Competitive Strategies Initiative. By playing to our strengths and capitalizing on the Pact's weaknesses, we can significantly improve our ability to deter aggression in Europe and to defend successfully should deterrence fail.

5. The East Asia Balance

The military balance in East Asia must be considered from two perspectives. First, East Asia and the Pacific region could be one theater in a global war involving the United States and the Soviet Union, as well as their allies and other countries within the region. Second, a number of military balances within the region are important in themselves and for their potential impact on U.S. and Soviet interests.

Several characteristics of this region distinguish it from the situation in Europe. First, there is no cohesive bipolar alliance system in the Pacific region. There are instead a variety of bilateral and regional ties, some directly or indirectly involving the United States and the Soviet Union. This region's immense geographic size also places vast distances between the United States, forward operating bases, and expected wartime operating areas. Related to this fact, and in contrast to the situation in Europe, is the absence in this region of large numbers of U.S. and Soviet ground force elements facing each other. Although ground forces are central to the Sino-Soviet balance, the Korean peninsula balance, and the Southeast Asia balance, naval and air forces would be key elements in any U.S.-Soviet confrontation. In the event of global war, two key U.S. missions will be countering Soviet submarines and dealing with the land- and sea-based threat to our carrier battle groups operating near the Soviet periphery.

The Soviets continue to upgrade their air and naval forces in the Far East Military District. Reorganized air units, revitalized air defenses, and the addition of front-line fourth-generation fighters and interceptor aircraft are some of the qualitative upgrades designed to modernize Soviet air forces in this theater. The Soviet Pacific Ocean Fleet remains the largest of the Soviet fleets in terms of surface ships and craft, submarines, and aircraft, and is second only to the Soviet Northern Fleet in strategic striking power (see Chart I.B.8). The recent addition of five new guided missile destroyers demonstrates the Soviet resolve to improve the Pacific Ocean Fleet's warfighting capabilities. In fact, the fleet continues to receive newly constructed major combatant units, submarines, and auxiliaries at a pace nearly equal to the Northern Fleet, the major Soviet fleet opposing NATO.

These qualitative improvements will permit the Soviets to defend farther from their homeland, thus placing U.S. allies at risk and complicating our plans for forward defense. Indeed, our ability to attack Soviet air power on the ground early in the war would be constrained by U.S. strike aircraft range limitations. Soviet strike aircraft en route to targets in the Pacific Ocean would be vulnerable to formidable U.S. naval air defenses, and U.S. and allied land-based interceptors. The distances from mainland Soviet air and naval bases to key Pacific LOCs, and the requirement to cross over or near U.S. allies' territory to attack the LOCs, are additional obstacles to any Soviet efforts at interdiction. These distance and time factors also would combine to provide our allies warning of an attack.

One key asymmetry unfavorable to the United States is the Pacific Theater target base. While targets for U.S. operations against the Soviets (air fields, naval bases, communications facilities, weapons storage facilities, and industrial targets) are numerous, dispersed, heavily defended, and in many cases hardened, similar U.S. targets for Soviet attack are few in number, lightly defended, and vulnerable. Although host nations can assist in the defense of some forward bases, such assistance is not guaranteed and in some cases may not be adequate against a determined Soviet attack.

The ongoing elimination of SS-20 IRBMs in the Far East as a result of the INF Treaty is welcome. The Soviets, however, continue to maintain strategic nuclear superiority over the Chinese and present a continuing nuclear threat to the Far East. The theater nuclear balance favors the Soviets in all areas, including number of warheads, number of delivery platforms, and range capability.

Improvements to Soviet ground forces, especially those opposite China, have continued at a steady pace, although Gorbachev's proposed force reductions may, if realized, alter the situation. China's leadership characterizes the current international environment as one of reduced tensions. Major advances in Chinese military capabilities are unlikely in the near term due largely to economic constraints and the immense task of restructuring the military. The PRC continues to look to the United States and other Western nations for expertise in military organization and technology. Beijing's aim is to modernize industry to produce new generations of weapons; to prepare its military organization and personnel to absorb the advanced weapons that will be available in the mid- to late-1990s; and to become proficient with those weapons while operating under new doctrine and tactics.

Emphasis today is on military education and training, weapons R&D, and reorganization. In the offing is

Growth of the Soviet Pacific Ocean Fleet
Compared to Growth of the Soviet Northern Fleet

Chart I.B.8

Pacific   **Northern**

General Purpose Submarines[a]

Carriers & Large Principal Surface Combatants[b]

Smaller Principal Surface Combatants[c]

ASUW & ASW Patrol Combatants[d]

Mine Warfare Ships[e]

Large Amphibious Warfare Ships[f]

NOTE: Submarine totals do not include SSBNs or SSBs. Data do not reflect reserve units, nor do they include units in long-term overhaul.

[a] General Purpose Submarines include SSGN, SSG, SSN, SS, SSAN, SSA, SSQN, SSQ, SSUN, SSA, and SST boats.

[b] Carriers and Large Principal Surface Combatants include CVHG, CGN, CG, CL, DDG, DD, Krivak I/II FFGs, and Krivak III WFF ships.

[c] Smaller Principal Surface Combatants include Kola/Riga FFs, Petya/Mod Petya FFLs, and Grisha FFL/WFFL ships.

[d] ASUW and ASW Patrol Combatants include PGG, PG, and WPG ships.

[e] Mine Warfare Ships include MSF and MSFT ships.

[f] Large Amphibious Warfare Ships include LPD and LST ships.

*As of 30 October 1988.
(Other years as of 1 July)

the transformation of China's traditional infantry divisions into mechanized combined arms divisions with major increases in mobility and firepower. The military balance on the continent favors the Soviets from the standpoint of modern combined arms forces. The Soviets, however, are hindered by the vastness of the territory confronting them, the constant threat of a two-front war, and lengthy and vulnerable supply lines.

The regional balance between North and South Korea remains a key factor in U.S. military planning for the East Asia-Pacific region. The quantitative balance continues to favor the North, making the recent apparent increase in military cooperation between the Soviet Union and the Democratic People's Republic of Korea of special concern (see Table I.B.1). Deliveries of first-line Soviet fighter and attack aircraft must be monitored carefully, given the South's reliance on qualitative advantages to offset superior numbers of North Korean equipment. While improvements in air power and armor will sustain U.S. and South Korean forces over the near-term, the success of democracy and the economic vitality of the South remain the long-term keys to prosperity and security. The long-term prospect for the balance on the peninsula remains highly favorable, but Pyongyang's current force modernization, its historic hostility, and its unpredictable behavior warrant caution.

U.S./ROK/DPRK Force Comparisons

Table I.B.1

Ground Forces

	North Korea	South Korea	United States
Personnel	743,800	542,000	35,000
Maneuver Divisions	26	23	1
Maneuver Brigades	55	3	1
Special Operations Forces/Brigades	22	19	—
Reserve Forces	4.5 mil (est)	4.7 mil	—
Tanks/Assault Guns	3,570	1,500	200
Armored Personnel Carriers	1,610	850	220
Artillery (Tubes)	9,270	3,300	80
Multiple Rocket Launchers	2,050	140	—
Surface-to-Surface Rocket Launchers	9/18 (FROG 3-5/7)	12 (Honest John)	—

Air Force

	North Korea	South Korea	United States
Personnel	56,000	33,000	9,000
Total Jet Combat Aircraft	834	470	96
Air Defense Missiles			
SA-2 Sites	47	—	—
SA-3 Sites	6	—	—
SA-5 Sites	1	—	—
I-HAWK/Nike	—	24 (10 Sites)	—
Vulcan/Chaparral Systems	—	—	52

Navy

	North Korea	South Korea	United States
Personnel	41,500	29,000	400
Attack Submarines/Midget Subs	24/42	(1 R&D platform)	—
Total Fighting Ships (includes subs)	630	174	*
Total Personnel	**841,300**	**604,000**	**44,400**

*Within the 7th Fleet's area of operations.

The military balance in Southeast Asia is unchanged, although there are prospects for a reduction in tensions. The Sino-Vietnam border remains tense and Vietnamese troops continue to occupy Cambodia, although some withdrawals have begun and a complete withdrawal is possible in the context of a political settlement. Settlement of the Cambodia issue could affect much of Asia, as a major obstacle to improved Sino-Soviet relations will have been removed. A new emphasis by Hanoi on internal economic and management reform could focus Vietnamese attention inward and foster a period of development for the Southeast Asia mainland. Vietnam will continue to rely on the Soviet Union for economic and military aid, however, and the Soviets are expected to retain access to the Cam Ranh Bay naval facilities.

The United States enjoys favorable relations with most East Asian nations. These nations shoulder much of their own defense burden. Furthermore, many of our closest allies provide the forward base structure and support that is critical to our contribution to the region's defense. The economic strength of Japan, South Korea, Taiwan, Hong Kong, and Singapore, and the continued development of the economies of China, Thailand, Malaysia, and Indonesia are evidence of the

region's vitality and strength, particularly in contrast to the poor economic performance of North Korea and Vietnam. These tendencies make the long-term regional trends in the military balance appear favorable.

6. The Middle East / Southwest Asia Balance

At the most general level, U.S. Middle East/Southwest Asia (ME/SWA) regional goals include: resisting Soviet efforts to extend their regional influence; maintaining access to regional oil supplies; and promoting the security and stability of friendly states in the region. Soviet regional goals include ensuring that the Soviet border remains free from any significant threat, and increasing their regional influence relative to ours. Moscow also is aware of the importance of oil to Western economies and the strategic benefits which would accrue should they gain control of a significant portion of regional oil reserves.

The balance in Southwest Asia was threatened by the Soviet Union's invasion of Afghanistan in December 1979. Moscow badly underestimated potential Afghan resistance, however, and after nine years of bitter struggle, has apparently concluded that the costs of continuing the war outweigh any possible gains. Thus Moscow has formally committed itself to remove all its combat forces from Afghanistan by February 15, 1989. If the withdrawal is completed, Soviet capability to project military power into the Gulf region will have been reduced. The Soviets will, nevertheless, still station roughly 26 active divisions (25 ground and one airborne) in the southern Soviet Union, plus the four divisions (three motorized and one airborne) being withdrawn from Afghanistan. Fifteen fighter and fighter-bomber regiments, with over 700 tactical aircraft, are available to support ground operations. Furthermore, the Soviets' attempts to expand their regional influence through political means will increase. Indeed, several Gulf states have already established diplomatic ties with Moscow.

Our capability to provide direct military support to the region has been enhanced significantly over the past decade. Our U.S. Central Command develops specific plans and operational concepts focused on the region. Its potential force allocation includes more than six ground divisions and over 600 tactical aircraft. To test these forces and concepts, we conduct regular bilateral exercises in the region.

Despite Moscow's desire to expand its influence in the Gulf Region, based on their experience in Afghanistan the Soviets would not take lightly a decision to invade Iran, a country with twice the area and three times the population of Afghanistan, and with equally difficult terrain. Another disincentive would be the

damage to Soviet political objectives in Western Europe, Japan, and the ME/SWA region that would occur in the wake of an invasion. Should Gorbachev's political and economic initiatives for internal reform falter, however, and provoke serious political opposition at home, or if ethnic tensions between Soviet Armenians and Azerbaijanis escalate out of control, the situation could change dramatically. If this coincided with a disintegration of Iranian central authority, combined with a request for Soviet assistance from one of the factions struggling for control, the potential for Soviet intervention could increase. While rugged terrain in northern Iran is well-suited to defense, the Soviets have sufficient regional military capability to punch through to central and southern Iran. Once there, they would be dependent on extended land lines of communication (LLOCs) crossing very difficult terrain. If the Iranians permitted, U.S. air support could play a major role at this point, particularly in interdicting Soviet LLOCs, and in reducing the effects of Soviet close air support. In the absence of unified internal resistance and outside military support, however, Iran probably could not withstand an all-out Soviet push to reach the coastal areas.

Moscow's forces are not capable of projecting power ashore against significant military opposition in areas of ME/SWA not contiguous to Soviet borders. Moscow prefers to provide additional military equipment and supplies to a client state. Should the Soviets decide to become directly involved, however, they would probably send augmentation forces, such as pilots and air defense forces, rather than a major expeditionary force.

For example, in the 1973 Arab-Israeli war, our ability to resupply Israel by air played an important role in that country's victory. Over a 30-day period, we delivered to Israel more than 22,000 tons of supplies by air and more than 62,000 tons by sea. During the same period, the Soviets delivered to Libya, Egypt, and Syria an estimated 15,000 plus tons by air and over 200,000 tons by sea. Both U.S. and Soviet airlift and sealift capabilities have increased significantly since that time. Assuming no interdiction, both sides can support a high level of resupply to client states in the region. Although there is substantial danger of a U.S.-Soviet confrontation developing out of an Israeli-Syrian clash, if the conflict remains limited to Israeli-Syrian territory the potential outcome overwhelmingly favors Israel.

A series of Iraqi military victories in 1988, coupled with low civilian morale and war weariness among the Iranian population, probably played a dominant role in inducing Tehran to accept a cease-fire in the Iran-Iraq War. The substantially expanded Western naval presence in the Persian Gulf was undoubtedly a contributing factor in Iran's decision. While a major resumption

of hostilities appears remote, minor violations of the cease-fire and limited Iran-Iraq confrontations remain a distinct possibility. Given the present condition of the Iranian military, it will not represent a major threat for at least the near-term. On the other hand, Iraq appears better situated to increase its influence within the region, and has already begun to meddle in Lebanon by providing military equipment to the Lebanese Christian forces in opposition to Syrian interests.

India also seems determined to achieve a dominant position in the Indian Ocean region commensurate with its overwhelming preponderance in population, resources, and economic strength. India is building what will be a potent power-projection force by the end of this century, backed up by carrier air power, and increasingly effective surface and submarine forces. In missile and space developments, India is expected to be able to produce ballistic missiles by the mid-1990s. Despite the death of President Zia in August, the new Pakistani leadership appears committed to continuing to cooperate with the United States in opposing the Soviet presence in Afghanistan. Projected U.S. security assistance to Islamabad for the 1988 to 1993 timeframe will help Pakistan in modernizing its forces to sustain a credible deterrent in the region.

Our efforts to promote regional stability face several obstacles. Our support for Israel complicates our efforts to strengthen military ties with moderate Arab states. Although U.S. Persian Gulf naval operations have improved Arab perceptions of the advantages of cooperating with the United States, Arab states continue to question the depth of our resolve in difficult circumstances. Many also fear that close visible ties with the United States (i.e., in the form of local U.S. basing rights or prepositioned equipment) could prove internally destabilizing, or make them a target for external aggression. Finally, public opposition to U.S. foreign policies on the Arab-Israeli conflict will remain a useful tool for some Arab governments seeking to diffuse political opposition.

The Middle East/Southwest Asia region is steadily becoming a more dangerous place in which to operate. Regional military capabilities have dramatically increased over the past 10-15 years. The introduction of intermediate-range ballistic missiles (IRBMs), including the use of Scuds by Iran and Iraq, and the Saudi acquisition of the Chinese CSS-2 IRBM, are only the most recent and highly visible examples. By themselves, surface-to-surface missiles represent a difficult but perhaps manageable threat. When mated with chemical warheads, however, the threat increases substantially.

7. The Central American Balance

The United States' national security interests are intimately linked to the peace and security of Central America. Vital air and sea lines of communication (LOC) that pass through or near the region connect the United States with distant trade and alliance partners. Through these LOCs pass much of the strategic minerals and other raw materials necessary for our prosperity in peace and our survival in war. In the past, we have been able to protect our southern flank with a minimum military presence, enabling us to deploy our scarce military resources to defend our interests in other parts of the world.

The potential for increased regional stability has been greatly enhanced since 1981 by the movement toward democracy in Central America. This process, however, has been threatened by two Soviet proxies, Cuba and Nicaragua. Soviet military aid to Nicaragua during the first eight months of 1988 was over twice the amount provided by the United States to all of Central America. Soviet aid has allowed the Sandinista government to mount an increasingly effective campaign of diplomatic and military intimidation throughout the region while casting doubt on the United States' resolve and commitment to its allies there.

Since 1979, Nicaragua, with assistance from Cuba and the Soviet Union, has developed a military establishment with firepower and mobility unmatched in the region. By the end of 1987, the Nicaraguans had amassed an active duty ground force of some 80,000 personnel, dispersed throughout the country among 40 major garrisons and numerous smaller posts. In addition to 10 regular army motorized/mechanized infantry battalions and 12 counterinsurgency infantry battalions, the bulk of the Sandinistas' infantry consists of some 180 reserve and militia battalions. Nicaragua's borders are protected by a special border guard force, while the Ministry of Interior has direct command of its own brigade of 2,000 highly trained special forces troops.

The Nicaraguan army has some 150 tanks and 250 other armored vehicles. Fire support is provided by roughly 90 heavy artillery pieces, over 30 multiple rocket launchers, more than 400 antitank guns, and hundreds of mortars. The army possesses an elaborate infrastructure consisting of special engineering, chemical services, intelligence, and communications units to support its combat forces. In addition, the large numbers of vehicles provided by the Soviet Union and its allies have enhanced Sandinista mobility.

The 3,200-man Sandinista Air and Air Defense Force also has been substantially upgraded since 1979. Its fixed-wing aircraft inventory remains unsophisticat-

ed, but the helicopter inventory has grown rapidly with the delivery of over 50 medium-lift Mi-8/17 HIP and 12 Mi-25 Hind-D attack helicopters. The present-day 3,700-man Sandinista navy has grown from a small number of old patrol boats and landing craft to a more substantial fleet of 29 French, Soviet, North Korean, and Polish-made patrol boats and minesweepers, albeit with a very low operational rate.

This military buildup would have been impossible without Soviet and Cuban assistance. Currently, an estimated 1,000-1,500 Cuban military and security advisers, plus 100 Soviet and East bloc military and security advisers, operate in Nicaragua. The influx of military aid has grown steadily, as the number of Soviet-bloc ship deliveries of military equipment rose from six in 1982, to 37 in 1984, to 62 in 1987. By October 1988, the total value of war materiel shipped to Nicaragua had exceeded $2.7 billion.

In contrast, Costa Rica, Nicaragua's southern neighbor, has no army. Its 8,000-man Civil Guard and Rural Guard are essentially constabulary organizations, lacking heavy military equipment. Honduras, one of the poorest countries in the hemisphere, has been barely able to maintain a military force of some 17,000 personnel and 20 regular battalions. Lacking tanks, Honduras' primary deterrent to a Sandinista attack lies in its air force, composed of more than 20 F-5, A-37, and Super Mystere jet combat aircraft. El Salvador and Guatemala, although lacking common borders with Nicaragua, have not been insulated from the Sandinista threat. The 40,000-man Guatemalan military continues to confront a persistent leftist insurgency, while the 57,000-man Salvadoran Armed Forces remain tied down by Farabundo Marti National Liberation Front (FMLN) guerrillas. In both cases, the insurgents are supported by Cuba and the Sandinista government.

In summary, the military-security situation in Central America is directly influenced by the growing Nicaraguan military establishment with its extensive Soviet and Cuban support. To varying degrees, El Salvador, Honduras, and Guatemala have suffered from this Nicaraguan military position; and Costa Rica, and even Panama are vulnerable to future exploitation. While the United States is not directly threatened by the increasing military capabilities of Nicaragua or Cuba at this time, the fledgling democracies of Central America are. If we fail to support our friends and allies now, as they confront the growing security threat in Central America, we can expect to face a more serious threat much closer to our own borders in the future.

8. The Maritime Balance

The United States and its allies currently enjoy an advantage over the Soviet Union and its allies in nearly all areas of the maritime balance. This advantage is important to our ability to accomplish our strategic objectives because of the two oceans that separate the United States from its allies. Control of the sea lines of communication (SLOC) that cross these oceans is vital to our peacetime commerce and critical to the defense of U.S. interests and those of our allies in time of war.

The Soviet Navy's strategic wartime mission is to conduct nuclear strikes from SSBNs operating near the Soviet periphery and to deny Western navies access to maritime regions from which they could threaten Soviet SSBNs or the Soviet homeland. The Soviet Navy will attempt to destroy opposing nuclear-capable forces, such as U.S. sea-launched cruise missile (SLCM)-equipped submarines, surface ships, and aircraft carriers. The Soviet Navy also will attempt to disrupt the critical SLOCs to our allies, thereby disrupting our reinforcement of forward-deployed forces and placing in doubt our ability to defend successfully areas of vital interest.

The U.S. Navy's mission is to control these vital SLOCs and conduct offensive operations in Soviet maritime operating areas to deny the Soviets sanctuary and to place their naval forces at risk. The sea denial mission of the Soviets and Warsaw Pact, principally in waters near the Soviet Union, and the force-projection/sea-control missions of U.S. and allied navies are asymmetrical. This asymmetry drives force structure differences. The most notable of these differences are: the Soviet Navy's reliance on the submarine as its capital ship; the U.S. Navy's emphasis on carrier battle groups (CVBGs) and amphibious forces; and Soviet reliance on long-range land-based air power and proliferation of antiship cruise missiles to counter U.S. surface forces.

The Soviet Union has narrowed the maritime advantage of the Western powers, and this trend is expected to continue. For example, improvements in submarine quieting have helped the Soviets produce submarines that are nearly as quiet as their U.S. counterparts. These modern submarines will comprise a growing percentage of the Soviet submarine force. The United States, however, maintains an overall lead in submarine construction technology, quieting, antisubmarine warfare (ASW) systems, and number of operational modern submarines. The Soviet general purpose (diesel/nuclear attack and cruise missile) submarine force, however, outnumbers the U.S. submarine force by nearly a three-to-one margin. We effectively counter Soviet submarines today by our superior ASW capabilities. The Soviets do not have similar capabilities to challenge our submarines, nor can they effectively counter most of our ASW assets in the open ocean.

The Soviet submarine force is supported by a modern surface fleet, and by long-range land-based Soviet Naval Aviation (SNA) bombers and strike aircraft. Developments in the Soviet surface fleet are not as dramatic as those in the submarine force, but new units with improved capabilities continue to enter the fleet in sizeable numbers. Four new classes of cruisers and destroyers that first entered service in the early 1980s continue in production. These modern ships are all heavily armed with multiple weapon systems, have increased magazine capacity, and feature enhanced electronics. Twenty-five of the ships are now active with the Soviet fleets and more are on the way. The addition of these new principal surface combatants continues the Soviet trend of building larger, more capable ships able to operate on the high seas farther from the Soviet homeland. Yet even these new ships entering Soviet naval service do not possess the distinct advantages in surface fleet combat reach provided by carrier battle groups (CVBGs). The Soviets have yet to match the CVBG's sea-control capability and striking power. The Soviets, however, have recently launched their first aircraft carrier of a new, larger class. It should enter active service in the early 1990s. We estimate that the carrier will be used initially to extend the Soviet air defense umbrella, and not for power-projection operations.

Probably the most significant development involving the Soviet Navy is the progressive evolution of combined arms operations between their air and naval forces in homeland defense and fleet protection. In the combined arms approach submarines, and naval and air force aircraft armed with cruise missiles, present a formidable threat to U.S. and allied surface forces. The increased range and sustainability of their ships and aircraft, coupled with their combined arms capabilities, allow the Soviets to extend their "sea denial" zones around the Soviet homeland. This threat extension will test our capability to defend the sea lanes, but it will also complicate Soviet reconnaissance and surveillance capabilities. The technology in our new Aegis antiair warfare (AAW) systems is designed to combat this threat. Innovative antiair tactics using carrier-based aircraft and surface ships, and the proliferation of Tomahawk and Harpoon missiles on some submarines and nearly all types of surface ships will, along with Aegis, enable us to counter this threat and compound the Soviets' targeting problem.

In summary, the current U.S. and allied maritime balance advantage may be reduced as the Soviets continue augmenting and improving their naval forces. By the mid-1990s, improved Soviet submarines and the more capable surface combatants now entering the Soviet fleet will comprise a significant percentage of the Soviet Navy as older units are retired. The United States and its allies will retain significant advantages over the Soviets in tactical sea-based air power;

sustainability at sea; ASW; surveillance and reconnaissance; and in the ability to move significant naval forces to trouble spots throughout the world (see Chart I.B.9).

9. The Power-Projection Balance

Power projection deals with the ability to project forces to any contingency. Since we include elements of power projection in each of our regional balances, we will concern ourselves in this section with U.S. and Soviet capabilities to fight effectively in military contingencies beyond the immediate periphery of the Soviet Union. In essence, we are examining the ability of the superpowers to influence, directly and indirectly, the outcome of long-distance conflicts. A direct measure of power projection would be the capabilities of our respective militaries to move forces to contingency areas. (While key U.S. capabilities will be touched upon, a fuller discussion of U.S. force-projection capabilities is found in Chapter III.D.) Indirect instruments for distant power projection include arms transfers, military advisers, surrogate forces, and facilities access.

United States and Soviet power-projection capabilities must be compared not only with each other, but also with respect to the national military forces in various regions of the world that they might be supporting or opposing. An important trend affecting both U.S. and Soviet power-projection capabilities is the increasing sophistication and lethality of equipment possessed by Third World military forces. This is almost certain to make intervention in Third World regional conflicts an increasingly dangerous proposition.
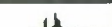
Soviet capabilities for direct warfare are greatest in the proximate theaters (Europe, ME/SWA, East Asia) discussed in the preceding sections. Because we have historically placed more emphasis on long-distance power projection than the Soviet Union, we are generally better postured for any conflict far from both countries. The Soviets, however, have made some progress in narrowing our advantage, primarily by employing the indirect instruments of power projection.

Soviet strategic airlift assets have improved considerably in both aggregate capacity and range (see Chart I.B.10); however, on balance, these forces still remain inferior to U.S. assets. The IL-76 Candid, first introduced into the Soviet inventory in 1976, is their first jet engine military transport. Replacing the AN-12 Cub, Candid has approximately twice the Cub's maximum payload and three times its range (at normal payload). At 400 knots, the Candid's cruising speed is about one-third greater than the Cub's. Furthermore, the AN-124 Condor, the Soviets' newest long-range transport, carried out a record-breaking long-distance flight around the periphery of the Soviet Union in May 1987. Soviet

NATO/Warsaw Pact Naval Forces

Chart I.B.9

Maritime Forces	United States	Non-U.S. NATO	Total NATO	Soviet[d] Union	Non-Soviet[e] Warsaw Pact	Total Warsaw Pact
Aircraft Carriers	14	2(2)	16	—	—	—
VSTOL Carriers	—	5	5	4	—	4
Helicopter Carriers	12	2	14	—	—	—
Battleships	3	—	3	—	—	—
Cruisers	36	4(2)	40	36	—	36
Destroyers	68	84(15)	152	51	1	52
Frigates[a]	119	188(25)	307	36*	—	36
Corvettes[b]	—	—	—	147**	27**	174
Submarines[c]	100	129(17)	229	299***	9***	308
Total	352	414(61)	766	573	37	610

Notes: Numbers in parentheses following numbers in the NATO column represent French ships included in the line and column totals.
[a] 2,000 tons and larger.
[b] Includes frigates under 2,000 tons.
[c] Does not include SSBNs.
[d] Includes Soviet Northern, Baltic, Black Sea, and Pacific Ocean fleets and the Caspian Flotilla.
[e] Includes the navies of Poland, East Germany, Bulgaria, and Romania.
* Soviet figure includes Krivak I/II FFGs.
** Soviet figure includes Koni/Riga FFs, FFLs, and 18 WFFLs. Non-Soviet Warsaw Pact figure includes Koni/Riga/Tetal FFs and Kaszub/Parchim I FFLs.
*** Soviet figure includes SSGN, SSG, SSN, SS, SSAN, SSA, SSQN, SSUN, and SST. Non-Soviet Warsaw Pact figure includes SS.

press reports suggest that Aeroflot plans to replace the IL-76 with the Condor on its flight routes from Vladivostok to Moscow and Berlin. While the Condor can carry heavier payloads than our C-5, it does not have in-flight refueling capability. In contrast, the C-5 and all other military transport aircraft in the U.S. strategic airlift fleet have in-flight refueling capability for increased range as required.

Our strategic airlift forces have also been improving as we continue working toward our 66 million ton-miles per day (MTMD) goal. Indeed, over the last eight years we have seen a 50-percent increase in our dedicated military airlift capacity. We have accomplished this increase by placing new wings on our C-5s and by procuring C-5Bs and K-10s. With the introduction of the new C-17 aircraft in FY 1991 we will be much closer to our goal.

Forces for sea-based power projection fall into two distinct, yet interrelated components: offensive forces and naval lift assets. Our long-distance amphibious as-

sault capability -- troop capacity and total lift -- remains far superior to that of the Soviet Union. Our surge sealift capability, however, is currently inadequate to meet our commitments. This is due to a number of factors including the decline in the number of militarily useful U.S.-flag merchant marine vessels. We have, however, made progress in offsetting the sealift problem by procuring and modifying eight ex-SL7 containerships into fast sealift ships; expanding the Ready Reserve Force (RRF); continuing allied shipping support; and prepositioning equipment, both ashore and afloat. Soviet naval lift, including its merchant marine element, its air cushion vehicle (ACV) fleet, and its developing wing-in-ground (WIG) units, is capable of delivering and sustaining overwhelming force to the periphery of the Soviet Union. It is not, however, currently capable of operating effectively outside the coverage of land-based air support. This is one of our enduring strengths. Our carrier battle groups and Marine Corps units, for which the Soviets have no real counterparts, are eminently more capable than Soviet forces of providing long-distance power-projection

Soviet Strategic Airlift
(FY 1980 - 88)

Chart I.B.10
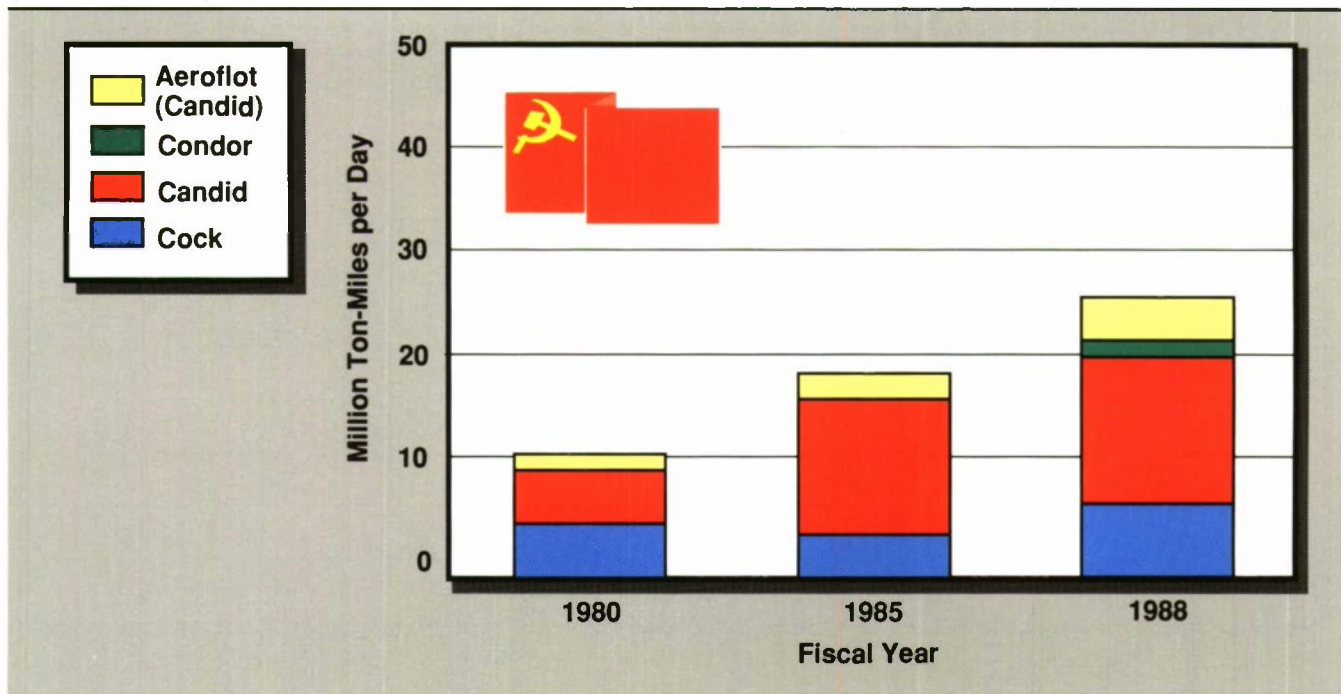
ashore. Furthermore, these forces are designed and exercised to protect our naval lift assets en route to their destination. Thus, despite the increases in Soviet long-distance power-projection capabilities, their forces remain dependent on air support based in the Soviet Union and are therefore not a match for our forces. Still, improved Soviet capabilities could make themselves felt where U.S. forces are not involved.

With regard to potential forward basing, Cam Ranh Bay in Vietnam and the increased Soviet activity in Tartus, Syria are examples of a growing Soviet capability to support long-distance power-projection operations. Further increases in Soviet strategic lift, coupled with their extensive merchant marine assets, could give Moscow the ability to move their short-range ACVs (and ultimately their WIGs) to areas far from the Soviet periphery. With additional support, potentially from forward-based MiG fighters and sophisticated air defense systems, the Soviets could pose a significant threat to many smaller nations. Additionally, with proper mobilization and support, these forces could pose a risk to our forces as well.

In several recent instances, the Soviets have exercised forces far from home. During one week in 1984, for example, the Soviets conducted an amphibious landing exercise in the South China Sea and a joint Soviet-Vietnamese amphibious exercise. Although this exercise was small by our standards, it demonstrated a capability to use Cam Ranh Bay as a forward staging base. Furthermore, Soviet naval reconnaissance and ASW aircraft travelling to and from Cuba conduct operations off our east coast. Soviet naval task force deployments to Cuba average about one per year, and often involve joint training exercises with the Cubans in the Gulf of Mexico and Caribbean.

In general, the Soviets have relied on indirect means to project power over long distances. Rather than direct military intervention, the Soviets have emphasized arms sales, military advisers, and surrogates to reduce Western influence. This approach is epitomized by the use of over 50,000 Soviet-supported Cuban troops in Angola; over $17 billion in arms sales to the Third World in 1987; and the stationing of more Soviet military advisers in Latin America and Africa than we have throughout the world. Furthermore, the Soviet merchant marine, an integral part of their military lift program, emphasizes self-contained assets to facilitate rapid on-loading and off-loading, and is designed with smaller Third World ports in mind. Such Soviet efforts, however, have been costly and have also suffered several setbacks in recent years. For example, the problems of heavily financed Soviet-backed regimes in Angola, Ethiopia, and Mozambique have imposed significant costs on the Soviets, both in terms of rubles and international prestige.

Today, the United States and the Soviet Union can often decisively influence the military postures of smaller states by making arms available or withholding them. Weapons production, however, is becoming much more widely diffused, and the superpowers will have less control over weapons transfers, including advanced systems. We have already begun to see this shift with the sale of Chinese ballistic missiles to Saudi Arabia, and the proliferation of sophisticated air defense systems in Libya and Syria. Furthermore, several countries that were listed among the less-developed countries -- India, Brazil, South Korea, North Korea, Israel, and Egypt, to name but a few -- are now building or have built sizeable arms industries. The proliferation of arms industries and of certain weapon systems -- particularly ballistic missiles and chemical weapons -- not only reduces the leverage conferred by U.S. and Soviet resupply roles, but raises the potential cost of intervention against countries possessing these weapons.

C. U.S. DEFENSE POLICY AND STRATEGY

1. Introduction

During this administration, we have developed and refined the economic, political, and military elements of our national power to meet America's basic security needs and enhance our security posture. It is on this foundation that we can build a strategy for preserving the common defense in the coming years. Our situation as we approach the 1990s is greatly improved over that which we had at the start of this decade. Then, there was need to restore America's security posture. When President Reagan took office in 1981, he established ambitious objectives to restore U.S. economic strength, military strength, prestige and credibility as a world leader, and pride in America while carrying our message of democratic self-determination to the world.

We are meeting these objectives, although not without cost, sacrifice, and some setbacks along the way. There is no question, however, that America's national power is significantly greater than it was eight years ago. What some do question is our ability to preserve our security in a rapidly changing world. They argue that, in relative terms, U.S. power and influence are not as great as they were in 1980. They point to a long trend of "decline" beginning in 1945 that shows an unambiguous erosion of our military and economic strength relative to the other nations of the world, and project for the United States a descent into the relative obscurity inhabited by other former great powers.

We disagree strongly with this vision of America's future, for several reasons. Our "decline" in recent years has been primarily a consequence of the growing strength -- especially economic strength -- of friendly, allied states. Far from discouraging this growth, however, we have actively encouraged it. Unlike other former great powers, we do not seek a *Pax Americana*, enforced by our military might. Rather, we seek a world of free, prosperous democratic states whose goal is economic cooperation, not military confrontation. Thus, our great contribution in bringing about the resurrection of Western Europe and Japan from the ashes of World War II should be viewed as success in achieving a long-standing national goal, not as an indicator of decline.

The 1980s certainly have not witnessed a decline in America's power relative to that of its principal adversary, the Soviet Union. Indeed, Chairman Gorbachev's policies of *glasnost* and *perestroika* reflect, more than anything, Moscow's recognition that, after over forty years of Cold War competition, the Soviets' long-term prospects are bleak. Since World War II, those nations that have adopted the communist political system, with its command economy, are either in the process of effecting large-scale changes, suffering poor growth compared to their neighbors, or sliding into economic ruin despite massive infusions of Soviet aid. In contrast, the United States has strong economic partners who compete seriously but peacefully with us for innovation and growth.

In sum, the collective strength of the United States and its allies, joined by the principles of collective security and commitment to a market-oriented international economy, has increased significantly this past decade relative to the strength of our potential adversaries. Indeed, we believe the success of our containment policy toward the Soviet Union has contributed to Chairman Gorbachev's call for fundamental changes in the Soviet economic and political structure.

In addition to such traditional concerns, in the coming years we will have to address new challenges emerging from our success. For example, our success in promoting a greater sense of security among our allies and friends has led some of these nations to question the desirability of retaining their U.S. military bases, which were -- and are -- important factors in providing for our collective security. Their rapid economic growth, while gratifying, also presents us with the need to address their growing political and economic power. Rapid advances in technology and the information revolution, reflecting the success we have enjoyed in economic growth and innovation, will require us to address the diffusion of technology and its effects on our security.

There is also the success our military strength has provided for us: the deterrence of both nuclear war and a general conventional war. This success, however, has been accompanied by a trend toward the ambiguous aggression of terrorism, insurgency, subversion, and drug trafficking. These "new" forms of conflict must be considered in developing a U.S. national security strategy for the 1990s.

This chapter addresses our role in supporting U.S. national security objectives through a military strategy of deterring aggression and, should deterrence fail, defending our interests through the strategic doctrine of flexible response. The following two chapters discuss the important role that collective security and arms control play in supporting this military strategy.

2. National Security Objectives

To secure U.S. national interests in the face of the threats described in the preceding chapter, we formu-

late and pursue a defense policy and military strategy. We have introduced significant improvements in our defense posture in the last eight years; still, the underlying objectives of our defense policy have shown great continuity. Our basic national security objective remains to preserve the United States as a free and independent nation with its fundamental institutions and values intact. Other major objectives are to:

- Safeguard the United States and its allies and interests by deterring aggression and coercion across the conflict spectrum; and should deterrence fail, by defeating armed aggression and ending hostilities on terms favorable to the United States and its allies.

- Encourage and assist our allies and friends in defending themselves against aggression, coercion, subversion, insurgency, terrorism, and drug trafficking.

- Ensure access to critical resources, markets, the oceans, and space for the United States, its allies, and friends.

- Where possible, neutralize Soviet military presence and influence throughout the world, increase the disincentives for Soviet use of subversive force, and encourage independent policies by Soviet client states.

- Prevent the transfer of militarily critical technology and resources to the Soviet bloc and hostile countries or groups.

- Prevent the spread of nuclear, chemical, and biological weapons.

- Reduce our reliance on nuclear weapons by strengthening our conventional and chemical deterrent; pursuing equitable and verifiable arms reduction agreements and insisting on compliance with such agreements; and pursuing technologies for strategic defense.

- Address the root causes -- military, political, economic and social -- of regional instabilities, and maintain stable regional military balances.

3. U.S. Military Strategy: Flexible Response for Deterrence and Defense

Developing a strategy involves relating ends and means. America's fundamental military strategy is to secure our objectives and defend our interests by deterring aggression against the United States, its allies, and

its interests. This requires that potential adversaries perceive that the costs to them of initiating aggression are likely to outweigh any benefits they might accrue. We also seek to prevent coercion of the United States, its allies or friends by any adversary.

An indispensable characteristic of any successful deterrent posture is its *credibility*. We seek to instill in potential adversaries a measure of both certainty and uncertainty. They must be certain of our strength, and our resolve to use it. Thus we must have -- and our adversaries must *perceive* that we have -- the *means* and the *will* to respond to aggression and resist coercion. We also deter potential adversaries by the uncertainty that arises when we avoid specifying the exact means, location, timing, and scope of our response to any aggression. We confront an aggressor with three types of possible response:

- *Direct Defense:* denying the aggressor's aims decisively at the point of aggression;

- *Conflict Escalation:* raising the level of conflict to deny the aggressor the ability to control or limit the costs associated with initiating hostilities; and

- *Retaliation:* imposing losses upon an aggressor that far outweigh any possible gains.

This "flexible response" approach is the key feature of our deterrent strategy. It is indicative of the great continuity in our military strategy, having been U.S. strategic doctrine for nearly three decades and NATO's for over two decades.

Flexible response is also our strategic doctrine for defending our interests if deterrence fails and we employ military force to preserve our security. Should this occur, we will seek, insofar as possible, to limit the scope, level, and duration of hostilities. Our strategy does, however, include conflict escalation, if necessary, to achieve our objectives.

4. Nuclear Deterrence and Strategic Defenses

a. Flexible Response: Foundation of U.S. Nuclear Deterrence

For the past 40 years, U.S. nuclear doctrine has been characterized by remarkable consistency. Since 1945, there has been only one major change in our nuclear doctrine -- the shift, during the Kennedy Administration, from massive retaliation to flexible response. Despite this continuity, three secretaries of defense since then have had to respond to charges that U.S. strategic nuclear doctrine had changed during

their tenure. This section states clearly what our nuclear strategy is -- and what it is not.

Whereas massive retaliation sought to deter any form of Soviet aggression through the threat of immediate, large-scale, nuclear attacks against military, leadership, and urban industrial targets in the Soviet Union, the key to flexible response is explicit in its name. Massive retaliation provided only two options to a president in the event of Soviet aggression -- do nothing, or launch a massive attack against the Soviet Union. As the Soviets acquired a nuclear capability, including the ability to strike targets in the United States, the credibility of a deterrent based solely upon this threat declined. The new flexible response doctrine increased the number of options available to the president, and provided the capability either to respond to Soviet aggression at the level at which it was initiated, or to escalate the conflict to a higher level.

Flexible response confronts Soviet attack planners with the possibility that we may respond to a conventional attack with conventional forces, or, if these fail to defeat the aggression, with land- and/or sea-based nonstrategic nuclear weapons, or with limited or massive use of U.S. strategic nuclear weapons against targets in the Soviet homeland. Flexible response has enhanced deterrence, multiplying the uncertainties confronting the Soviet leadership, and confronting them with the threat of costs that would far outweigh any gains that might be achieved through aggression.

Nuclear weapons are incorporated into our flexible response doctrine at two levels. On one level, U.S. nonstrategic weapons -- both land- and sea-based -- are incorporated into U.S. and NATO planning. These weapons could be employed to degrade Soviet military operations in a particular theater, and to induce the Soviet leadership to cease its aggression through the threat of further escalation. Strategic nuclear weapon systems are also included in planning for limited strikes to provide a capability to retaliate against military installations deeper in Eastern Europe or the Soviet homeland. The incorporation of U.S. nonstrategic and strategic systems in these options provides a president with greater flexibility.

On a second level, strategic nuclear systems are incorporated into U.S. nuclear war planning to provide the president with a series of large-scale alternative responses to a massive Soviet nuclear attack. These systems also provide the backbone for our alliance commitments. Since the inception of flexible response, planning for large-scale retaliatory options has emphasized the capability to strike at Soviet military targets separately, or in combination with attacks on Soviet leadership installations and/or the industrial base. The intent of these attacks is to deny the Soviet Union the

ability to achieve its war aims. By providing credible responses to the various potential levels of a major Soviet attack, these options fortify deterrence. In this context, our ability to withhold attacks against particular targets -- including installations in a subset of cities particularly valuable to the Soviet leadership -- is intended both to influence the Soviet attack planners' pre-war planning, and -- in the event of war -- to provide to the Soviet leadership an incentive to terminate their attacks short of an all-out exchange. Secretary McNamara's 1963 description of the rationale behind these options, during testimony before the House Armed Services Committee, remains valid today: "In talking about global nuclear war, the Soviet leaders always say that they would strike at the entire complex of our military power including government and production centers, meaning our cities. If they were to do so, we would, of course, have no alternative but to retaliate in kind. But we have no way of knowing whether they would actually do so. It would certainly be in their interest as well as ours to try to limit the terrible consequences of a nuclear exchange. By building into our forces a flexible capability, we at least eliminate the prospect that we could strike back in only one way, namely, against the entire Soviet target system including their cities. Such a prospect would give the Soviet Union no incentive to withhold attacks against our cities in a first strike. We want to give them a better alternative."

There certainly have been evolutionary adjustments to U.S. nuclear planning since 1963. For example, the massive buildup of Soviet strategic nuclear forces, changes to the Soviet target base, and a better understanding of Soviet strategy and war aims led to shifts in the targeting of U.S. nuclear weapons systems. Deployment of more accurate weapon systems; improvements to the capability, survivability, and endurance of our command, control, and communications systems; and upgrades to our nuclear planning system also have facilitated the construction of more selective and limited options. All of these modifications, however, have taken place in an evolutionary manner, within the framework of our flexible response doctrine, not as a series of different strategies imposed by each administration. In returning to the original term -- flexible response -- our intent has been to emphasize the continuity of our approach to this element of our defense strategy. Yet after more than 25 years of continuity, several myths have developed regarding U.S. nuclear policy. The following discussion is intended to dispel these myths and clarify our nuclear policy aims.

Myth 1: U.S. Nuclear Strategy is Based on Mutual Assured Destruction. Many critics have alleged that flexible response is simply massive retaliation by another name. In their view, the United States would respond to any Soviet nuclear attack with an imme-

diate, massive strike against the Soviet homeland, including its cities. Some even believe that the U.S. response should be directed solely against Soviet cities and population, and that this was at one time U.S. policy. But this mutual assured destruction philosophy has *never* been U.S. policy. As noted, for over a generation we have looked for ways to develop multiple options as a means of enhancing deterrence, increasing flexibility, and controlling escalation. As early as 1963 Secretary McNamara emphasized the importance of multiple options in U.S. nuclear planning. He noted that "we have to build and maintain a second strike force that has sufficient flexibility to permit a choice of strategies. . . ."

Secretary James Schlesinger, in his FY 1975 Report to the Congress, reaffirmed the importance of strategic force flexibility, noting that "If anything, the need for options other than suicide or surrender, and other than escalation to all-out nuclear war, is more important for us today than it was in 1960. . . . The Soviet Union now has the capability in its missile forces to undertake selective attacks against targets other than cities. This poses for us an obligation, if we are to ensure the credibility of our strategic deterrent, to be certain that we have a comparable capability in our strategic systems and in our targeting doctrine, and to be certain that the U.S.S.R. has no misunderstanding on this point. . . ."

In his FY 1982 Report to the Congress, Secretary Harold Brown again reaffirmed the importance of selective and limited options, observing that "Our planning must provide a continuum of options, ranging from small numbers of strategic and/or theater nuclear weapons aimed at narrowly defined targets, to employment of large portions of our nuclear forces against a broad spectrum of targets."

The capability to respond in an across-the-board manner has always been *one* of the components of U.S. nuclear strategy planned under flexible response. Indeed, that capability -- to inflict unacceptable damage on the Soviets' military, leadership, and industrial infrastructure -- may be the key deterrent to a massive Soviet attack. Deterrence, however, may fail on *less* than a massive scale. The importance of this fact was noted by Secretary Weinberger when he discussed what would happen if deterrence failed: "If that were to occur we cannot predict the nature of a Soviet nuclear strike, nor assure with any certainty that what may have started out as a limited Soviet attack would remain confined at that level. Nevertheless, we must plan for flexibility in our forces and in our response options so that there is a possibility of reestablishing deterrence at the lowest possible level of violence, and avoiding further escalation."

The declining credibility of a single massive response as the sole deterrent to less than all-out aggression was recognized even in 1961, when we still had significant nuclear superiority. In fact, that recognition played a significant part in the shift to flexible response. Indeed, the key element which has, from the outset, differentiated flexible response from massive retaliation is the provision for options apart from an all-out response.

Myth 2: U.S. Strategy is Based on "Nuclear War Fighting." Many of those who believe mistakenly that U.S. nuclear strategy was once based on MAD have also criticized the U.S. government for "shifting" from this strategy. They contend that we have adopted a nuclear warfighting strategy. These critics seem to believe that our mere possession of nuclear weapons is sufficient to deter Soviet aggression. In their view, if deterrence ever fails, the inevitable outcome will be a spasm nuclear war immediately involving massive attacks on cities. According to this philosophy, developing plans and acquiring capabilities for more selective employment options undermines stability and deterrence, and suggests our intention to fight a "limited" and/or "protracted" nuclear war.

If a limited nuclear warfighting capability is one in which a single or small number of nuclear weapons are used in an attempt to end a major conventional war before it escalates to all-out nuclear war, then, in fact, we do possess such a capability. If a protracted nuclear warfighting capability is one in which nuclear forces and their supporting command and control structure might be available and effectively employed for more than 30 minutes following the onset of a Soviet nuclear attack, then we also possess this capability. The critical question is: Do these capabilities strengthen our ability to deter? The answer is "yes."

It is not our intention to fight a nuclear war of any description: "limited" or "massive," "prompt" or "protracted." It is our policy to *prevent* nuclear war. In doing so, we must determine what would deter the *Soviet* leadership from considering aggression -- *not* what would deter us. In that regard, we have watched the steady buildup of Soviet strategic nuclear forces for over two decades, and the Soviet leadership's preparations for nuclear war, along with evidence that reflects their belief that such a war may, under certain circumstances, be fought and won. That evidence includes:

• The Soviets' capability to reload many of their ICBM silos after launch of the first ICBM; a capability supported by spare ICBMs and reloading exercises.

- Their continued expansion of a nationwide network of over 1,500 buried command bunkers for the Communist Party and military leadership, plus an extensive mobile command system -- both supported by an extensive communications network.

- Increasing Soviet deployments of mobile ICBMs -- the SS-24 and SS-25 -- which, with their greater survivability, could be employed over an extended period.

The Soviets clearly can conduct both limited and protracted nuclear attacks. We must deter them from these types of aggression. Indeed, we must make a Soviet victory, as seen through Soviet eyes and measured by Soviet standards, impossible across the broad range of scenarios the Kremlin leadership might consider. We may not agree with the assumptions upon which Soviet strategy appears to be founded, but we must design a deterrent strategy that takes these factors into account to remove any temptation for the Soviet leadership to believe they could fight and win a nuclear war. Our forces and our flexible response doctrine are designed to maximize the uncertainties that Soviet leaders would face, and confront them with an unfavorable outcome in *any* contingency in which they may contemplate aggression.

Myth 3: As Part of its Nuclear Strategy, the U.S. Relies on a Launch-Under-Attack Policy. Over the past decade, as Soviet ICBM counter-silo capabilities improved, some have questioned the continued survivability of the ICBM leg of the Triad. Rather than abandon one leg of the Triad, however, successive administrations chose to modernize the ICBM force by deploying the Peacekeeper ICBM in a survivable basing mode. In 1986, we decided to deploy Peacekeeper in a highly survivable rail-based system. Predictably, many of the critics who question the continued value of the ICBM force began to assert that no truly survivable basing mode could be established. They contend, therefore, that the United States has shifted to a launch-under-attack posture, since our ICBMs would be destroyed unless launched prior to the impact of the incoming Soviet attack.

As noted, successive administrations have devoted considerable effort and resources to increasing the flexibility and the number of choices available to the president should deterrence fail and the use of nuclear weapons become necessary. Asserting that the United States maintains a launch-under-attack policy ignores these efforts, and the deterrent provided by the Triad. We have not spent billions of dollars to modernize and increase the capabilities of the bomber and sea-based legs of the Triad only to leave the president with a single effective option with which to respond to a massive Soviet attack. We do not, however, intend to re-duce the uncertainties facing Soviet attack planners -- or the Soviet leadership. In order to increase the uncertainties in the minds of Soviet planners, it is not our policy to explain in detail how we would respond to a Soviet missile attack. However, the United States does not rely on its capability for launch-on-warning or launch-under-attack to ensure the credibility of its deterrent. At the same time, our ability to carry out such options complicates Soviet assessments of war outcomes and enhances deterrence.

b. The Strategic Nuclear Modernization Program

A decade of largely deferred modernization during the 1970s raised questions about the Triad's effectiveness, even as the Soviet Union continued an unprecedented buildup of its own nuclear forces (see Chart I.C.1). In response to these problems, President Reagan, in October 1981, announced the strategic modernization program. The program is designed to ensure that the Soviet leadership can realize no conceivable benefit from initiating nuclear aggression, by accomplishing two general goals: first, to improve the survivability of our present and planned forces so they do not destabilize potential crises by offering lucrative targets for Soviet preemption; and second, to sustain the credibility of deterrence by developing the capability to threaten, and destroy if necessary, the full spectrum of potential Soviet targets. Our success in meeting these goals is discussed in detail in Chapter III.F. We also have developed more selective, discriminating, and controlled responses to the various potential Soviet acts of aggression. This increased flexibility enhances our ability to deter nuclear and nonnuclear attacks against us or our allies.

Despite the significant improvements that we have realized through strategic modernization, critical components of the program remain to be completed. Several programs are now in advanced stages of development or nearing deployment. Continued congressional support for the strategic modernization program is essential to ensure the credibility of deterrence and the effectiveness of our flexible response doctrine. As Secretary Brown observed, "When we build, the Russians build. When we stop -- the Russians build." Even as we have modernized our strategic forces, the Soviet Union -- having only recently completed deployment of its fourth generation ICBM systems, as well as new classes of SSBNs and SLBMs -- undertook testing and deployment of entirely new systems for each leg of its strategic nuclear forces (see Chart I.C.2).

A Comparison of U.S. Strategic Force Procurement Expenditures with the Estimated Dollar Cost of Soviet Strategic Force Procurement Expenditures

Chart I.C.1
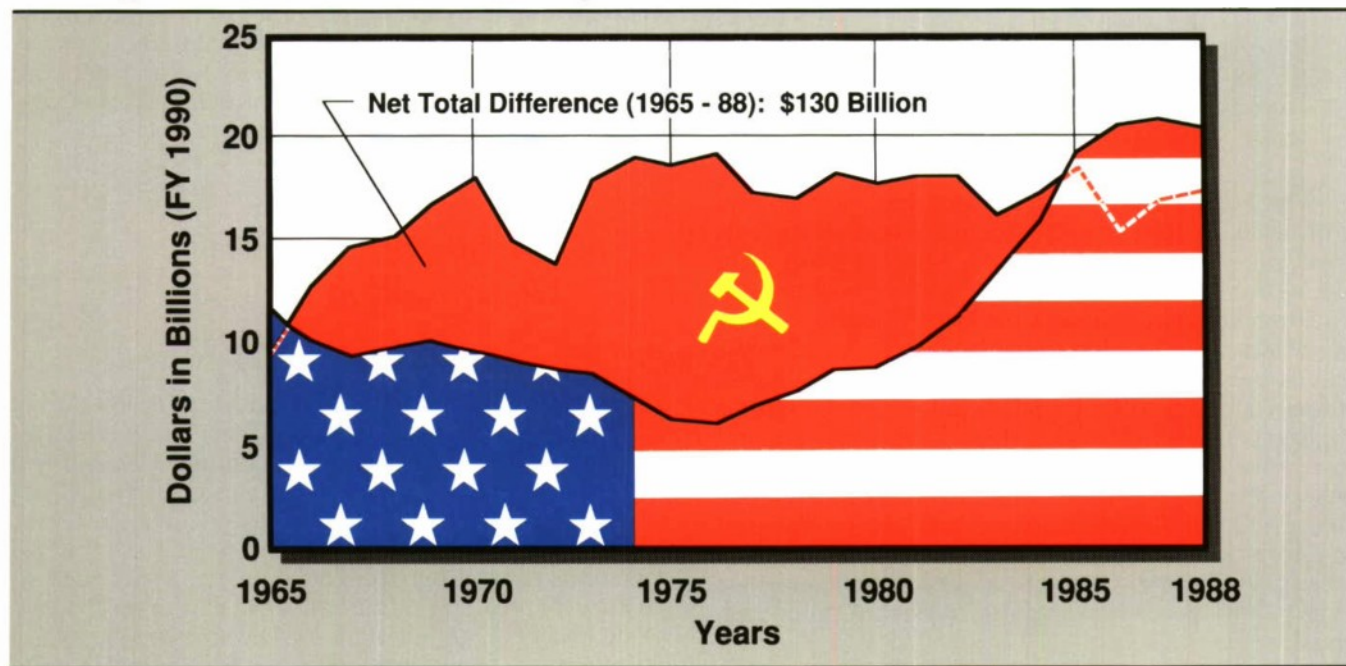
c. Nonstrategic Nuclear Forces

Our nonstrategic nuclear forces (NSNF), deployed on land and at sea, are an essential link between our conventional and strategic nuclear forces. They contribute to the spectrum of retaliatory options required by flexible response and, therefore, help deter aggression. Thus, we and NATO must have diverse and operationally flexible NSNF with long- and short-range capabilities. Indeed, the forward deployment of our nuclear weapons in Europe in support of U.S. and allied conventional forces is vital to NATO's deterrence strategy; demonstrates our commitment to the defense of Europe; and provides for allied participation. By eliminating an entire class of NSNF, the INF Treaty provides important security benefits to NATO. The treaty does not, however, reduce the need to continue modernizing the forces that remain.

Two critical NATO requirements -- identified long before conclusion of the INF Treaty -- are a nuclear tactical air-to-surface missile to replace a portion of the nuclear bombs on U.S. and allied aircraft, and a longer-range, more survivable replacement for the aging nuclear-capable Lance surface-to-surface missile. Deployment of these systems, coupled with continued modernization of NATO's nuclear artillery, will enhance deterrence and may open the prospect of further reductions in the number of nuclear weapons in Europe, in accordance with the Alliance policy of possessing the minimum level of nuclear weapons adequate for deterrence. Any reductions, however, must be contingent upon modernization.

The United States also deploys NSNF on a wide variety of ships. In addition to helping deter Soviet first use of nuclear weapons at sea, U.S. nuclear antisubmarine weapons serve as a hedge against a massive and catastrophic failure of our conventional systems. Nuclear-capable carrier-based aircraft and nuclear Tomahawk sea-launched cruise missiles have three vital roles: contributing to our nuclear reserve force; providing a worldwide deterrent presence; and deterring attacks on our naval forces by Soviet nuclear antiship missiles (especially those aboard Backfire and Badger bombers). Our sea-based NSNF, along with our land-based forces, support our policy of confronting the Soviet leadership with uncertainty and risk should they contemplate the use of nuclear weapons at sea. Continued deployment of the nuclear Tomahawk, development of a nuclear depth/strike bomb, and the addition of a nuclear capability to the Sea Lance antisubmarine missile are all essential to ensuring the credibility of our maritime nuclear forces.

Major Strategic System Deployments

Chart I.C.2
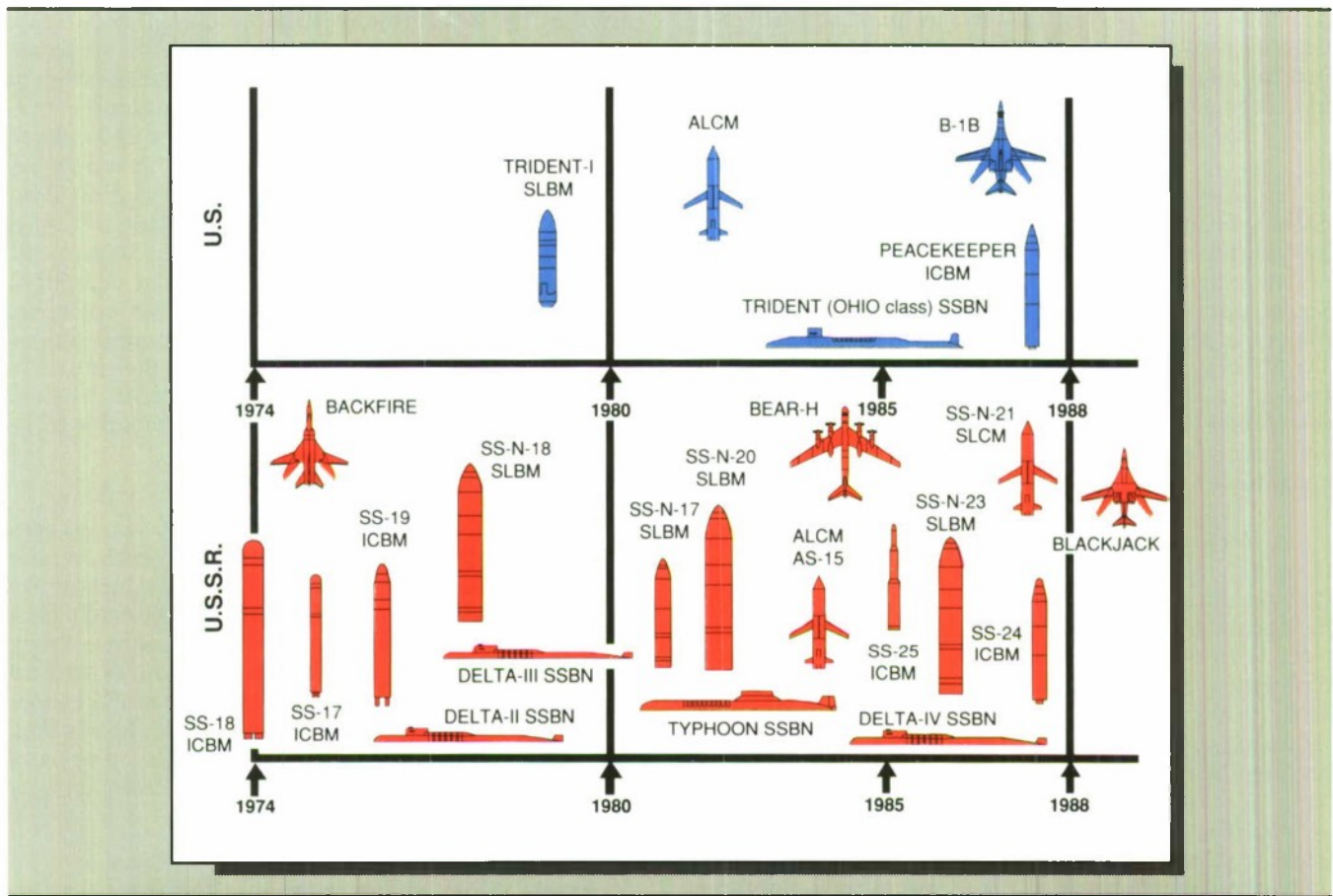
d. *Strategic Defense*

(1) Deterrence through Defense

Efforts to defend against nuclear attack have generally played an important role in American postwar strategy. The exception was during a 15-year period between the late 1960s and 1983, when the rapid buildup of Soviet nuclear missile forces and a corresponding lag in our progress on technologies for defending against ballistic missile attack combined to dampen U.S. interest in strategic defenses. Indeed, it was not until the early 1980s that technological progress allowed us again to accord a high priority to strategic defenses. In 1983, President Reagan announced the Strategic Defense Initiative (SDI) to determine the feasibility of deploying an effective defense against ballistic missiles for the United States and its allies. On the basis of technical progress in this vital research effort, the United States is now examining options for deploying the first phase of a strategic defense in the 1990s.

For over a generation, the Soviets have been expanding and modernizing not only their offensive nuclear forces, but investing vast sums in strategic defenses and other defensive measures as well. The result is an extensive, multifaceted, operational strategic air and missile defense network, as well as an active research and development (R&D) program in both traditional and advanced antiballistic missile (ABM) defenses.

If left unanswered, Soviet offensive and defensive force developments will undermine our ability to deter a Soviet attack. Furthermore, if Moscow retains and improves its monopoly on defenses against ballistic missiles, the Kremlin might come to believe that it could launch a nuclear attack against the United States or our allies without fear of effective retaliation.

Some critics have condemned our SDI program as jettisoning deterrence in favor of ineffective defense. Yet even the Soviets understand that it is incorrect to pose this critical issue as a choice between defense and deterrence. The Soviets are well aware that even partially effective defenses can provide a significant deterrent to aggression. The SDI program signals *not* the abandonment of deterrence, but a desire to fortify it in a way that would actually reduce the risks of war.

In short, the deterrent value of strategic defenses derives from the effect these defenses would have on Soviet assessments of the costs and benefits of launching an attack. Defense would enable us to influence the Soviet decisionmaker's views by diminishing his confidence in the ability of his forces to execute an effective attack, rather than by increasing the severity of our retaliation. Furthermore, such a defense would offer the United States and its allies some protection should deterrence fail, or in the event of an accidental or unauthorized missile launch.

A deployed strategic defense would become even more important in a world with reductions in offensive systems. Strategic defenses would help to ensure stability during the transition period as we reduce our nuclear missiles. Finally, given the Soviet Union's record of treaty violations, deployed strategic defenses could help ensure that once we have negotiated very deep reductions of ballistic missiles, we would not be threatened by their clandestine return.

In sum, our SDI has the potential to move us toward a safer world, one with reduced levels of arms and with deterrence based on defense rather than the threat of retaliation. We will continue our efforts to convince the Soviets to join us in working out a stable transition toward this sane and achievable goal.

(2) Strategic Defense Operational Requirements

Any strategic defense system developed, like other major military systems, would have to meet specific standards before a decision could be taken to begin deployment.

A defense against ballistic missiles must be able to destroy a sufficient portion of an aggressor's attacking forces to deny him confidence that he can achieve his objectives. In doing so, the defense should have the potential to deny an aggressor the ability to destroy a militarily significant portion of the target base he wishes to attack. Furthermore, if a deployed defensive system is to have lasting value, technology and tactics must be available that would allow the system to evolve over an extended period, in order to counter any plausible "responsive" threat.

Advanced defenses must be adequately survivable. They must not only maintain a sufficient degree of effectiveness to fulfill their mission even in the face of determined attacks on the defense, but also maintain stability by discouraging such attacks. The offense must be forced to pay a penalty if it attempts to negate the defense. This penalty should be sufficiently high in cost and/or uncertain in achieving the required outcome that such an attack would not be contemplated seriously. In the context of the SDI, survivability would be provided not only by specific technical measures such as employing maneuver, sensor blinding, and protective shielding materials, but also by strategic and tactical measures such as proliferation, deception, and self-defense. System survivability does not mean that each and every element of the system need survive under all sets of circumstances; rather, the defensive force as a whole must be able to achieve its mission, despite any degradation in the capability of some of its components.

We will consider, in our evaluation of options generated by SDI research, the degree to which certain types of defensive systems, by their nature, encourage an adversary to overwhelm them with additional offensive capability while other systems can discourage such a counter effort. We seek defensive options -- as with other military systems -- that are able to maintain capability more easily than countermeasures could be taken to try to defeat them. This criterion is sometimes couched in terms of cost-effectiveness. However, it is much more than an economic concept.

Based on our desire to increase the role of active defenses against ballistic missiles in our overarching policy of deterrence, the Joint Chiefs of Staff (JCS) in June 1987 formally established military/operational requirements for a Phase One Strategic Defense System (SDS). The initial requirements acknowledge and confirm the President's long-term objective to develop a thoroughly effective defense that will protect the United States and its allies from the threat of attack from ballistic missiles of all ranges.

The JCS requirements are firmly rooted in the basic concept of deterrence; that is, the system first and foremost should enhance our ability to deter a strategic nuclear attack against ourselves or our allies by creating added uncertainty in the minds of Soviet warplanners as to the outcome of any such attack. Furthermore, the Phase One SDS requirements represent the minimum level of military effectiveness that the JCS consider to be a meaningful addition to deterrence. It is important to understand that the Phase I requirement is neither an end in itself nor an endorsement of any particular system or architecture of systems, but is a minimum set of requirements on a path

leading to a comprehensive, fully reliable ballistic missile defense (BMD) system.

(3) Overall Program Goals

Critics of the program have recently claimed that the program is falling far short of the President's hopes. This claim comes at precisely the time the Phase One SDS is coming into greater focus. Yet, critics have chosen to treat this step forward as a retreat from the President's initial vision, citing the fact that Phase One will provide only a partial defense against missile attack. In addition, critics ask, why build a first phase if it is not perfect?

These arguments miss the point. They fail to see that Phase One is a starting point, not the final system. SDI's ultimate goal has not changed. The path toward the President's vision is a staircase. Advance will come a step at a time, and Phase One is the first step along that path. In addition, even a partial defense will greatly strengthen our deterrent. Perfect protection is not the issue. The critics who fault Phase One's "leakage rate" in the event of an attack are not interested in reminding us that today we cannot stop a single missile launched against us -- in other words, that our present "leakage rate" is 100 percent. The fact that Phase One is not a perfect defense is no reason to remain defenseless.

5. Deterrence and Defense Against Nonnuclear Aggression

a. The Role of Conventional Forces

Flexible response provides us with the option of responding to nonnuclear aggression with nuclear or nonnuclear forces. Our nuclear forces cannot, however, substitute for the deterrent effect of robust, effective conventional forces and the defensive capabilities they provide. Conventional capabilities can provide a credible deterrent to potential adversaries, who cannot doubt that we will respond in kind to conventional aggression. Effective deterrence at the conventional level has important political advantages as well: its credibility in a variety of scenarios makes it more effective for rebuffing intimidation and coercion. Furthermore, a strong conventional force posture that enables us to terminate hostilities below the nuclear threshold is an attractive alternative for the populace and leaders in threatened countries. The NATO Alliance recognizes the need for strong conventional forces to counter the military threat posed by Soviet forces, and to maintain our security against Soviet efforts to intimidate and weaken the resolve of our citizens and governments.

Our conventional posture is becoming increasingly important due to several related trends and developments. First, emerging Soviet military capabilities put an increased premium on our maintaining effective conventional forces for deterrence and defense. Second, Moscow's vigorous efforts to project a congenial diplomatic image and to assert a new defensive military orientation involving "reasonable sufficiency," when combined with Gorbachev's announced intention to reduce Soviet conventional forces, may tempt the United States or its allies to adopt a less robust conventional defense posture. Until Moscow matches its rhetoric with actual reductions in its military capabilities, however, we must continue to maintain a strong conventional force posture.

Third, we and our allies should not ignore the potential effect of dramatic political developments on the Soviet military. We are now pursuing with the Soviets some realistic approaches to conventional arms reductions to enhance security in the entire European region. These approaches include substantially asymmetrical force reductions to eliminate the current Soviet advantages in force levels, advantages that will persist even if Gorbachev's announced unilateral reduction in Soviet forces takes place. Experience shows that the prospects for serious conventional arms negotiations will rest, to a considerable extent, on the strength of our conventional force posture as the base from which we negotiate.

b. A Balance of Conventional Forces: Quantity and Quality

Providing a conventional force posture capable of deterring aggression, or defeating an attack if deterrence fails, does not mean that our forces must equal those of our adversaries in a simple numerical "bean count." Differences in the quality of forces, as well as geography, security objectives, defense strategies and military doctrines, alliance relationships, and numerous other factors affect the size and composition of forces required for flexible response. For example, the United States is separated from its allies by oceans, while the Soviet Union is a continental power, with overland access to its allies, and to many U.S. allies as well. We therefore have different power projection and naval force requirements; indeed, the sea lanes are as important to the United States as roads and railroads are to the Soviets.

We also recognize that the Soviets' numerical superiority and the threats of potential adversaries in other regions mean that we may face attacks in more than one geographic area. To counter this multifaceted threat, however, our strategy does not require us to "fight everywhere at once." To be capable of meeting simultaneously all the possible contingencies we can

foresee is beyond our means. Still, we and our allies together can and must maintain forces sufficient to convince potential adversaries of our ability and resolve to defend our vital interests. Should aggression occur in several areas simultaneously, our military responses would be governed by our existing commitments; general strategic priorities; the availability of forces; and the specific circumstances present. Furthermore, our strategy does not necessarily require that we respond to aggression at the same level of intensity that it was initiated. We also have the option of countering aggression with military operations in a different geographic location of our choosing, where our relative advantages may enable us to influence favorably the overall outcome of hostilities. Still, we do not view this capability as a substitute for defending our interests at the point of attack. To offset Soviet quantitative advantages, we also rely on our forces' superior quality. "Quality" means highly capable military personnel, as well as developing and employing superior military technology.

In sum, the last eight years have seen significant improvements made in our conventional force posture, but declining resources in recent years have forced reductions in planned programs. These reductions do not require us to discard our military strategy. They do, however, entail acceptance of increased risks to our national security.

c. Flexibility, Forward Deployment, and Power Projection

We can never predict with certainty the exact location, time, or nature of aggression. Consequently, our strategy requires our forces to be equipped and trained to operate in a variety of terrains, climates, and combat environments, and to deploy quickly to any location where they may be needed. To meet these requirements, we field sophisticated military units and equipment capable of executing a variety of missions and adapting to particular situations.

We must also respond to aggression as far forward from our shores as possible. To this end, we maintain continuous forward deployments of forces at bases in Europe and the East Asia/Pacific region. These deployments, along with intermittent exercises, fulfill commitments to our allies and demonstrate our resolve to support the common defense. Forward basing also promotes efficient use of alliance resources; for example, by taking advantage of existing base facilities, we reduce airlift and sealift requirements to transport forces from bases in the United States.

Of course, we cannot predict where we may need to deploy forces. Thus, in addition to forward-based units, we field rapidly deployable forces. To deploy

these forces we maintain extensive airlift and sealift capabilities as discussed in Chapter III.D. Agreements with allies and friends abroad to allow U.S. overflights and access to ports and airfields contribute significantly to our power-projection capability. To ease further our airlift and sealift requirements, we have prepositioned equipment ashore and afloat in forward areas for use by deploying forces.

d. Mobilization Capability

Our ability to mobilize America's national military capabilities -- both human and industrial -- is crucial to effective deterrence and defense. Our mobilization plans (as described in Chapter III.D) are based on our Total Force policy. The active component of our Total Force is maintained at high readiness to respond to a crisis or aggression on short notice. Reserve components could be called up to expand our force structure rapidly in a crisis. Our policy is to rely on a cost-effective mix of Total Force elements. We also rely on a cost-effective mix of war reserve stocks and industrial surge and mobilization capability to bring the Total Force up to wartime authorized levels of materiel readiness and sustainability. To this end, industrial mobilization efforts might include early production of important long-lead items; industrial surge to increase rapidly our output of high-priority defense materials such as critical munitions; and sustained production increases to support wartime consumption rates. For an extended discussion of these issues, see Chapter II.E.

We are now institutionalizing a graduated mobilization response doctrine and system to provide preplanned graduated steps to respond to a wide range of possible warning indicators. This will expand our flexible response options through modulated mobilization responses for deterring, or responding to, aggression.

e. Chemical Deterrence and Defense

About 20 nations have, or are capable of producing, chemical weapons, and new and more deadly agents continue to emerge. Our goal is to deter chemical and biological warfare pending a comprehensive, effectively verifiable, and global ban of these weapons. Possessing a credible chemical defensive and retaliatory capability is an effective deterrent against attack with chemical weapons. History indicates that deterrence is enhanced if we can operate in a chemical environment while maintaining a capability to employ chemical weapons in retaliation. We will, of course, never be the first to use chemical weapons, nor will we produce, stockpile, or use biological or toxin weapons.

In 1981, this administration resolved to rebuild both the retaliatory and defensive elements of our

chemical deterrent. Since then we have made considerable progress. New defensive equipment and tactics have improved our ability to fight on the chemical battlefield. Our first new chemical munition in over 20 years, the 155mm binary artillery round, began production in FY 1988. Other binary weapons -- the Bigeye bomb and the MLRS chemical warhead -- will become operational in the next decade. We must also improve our chemical defenses -- including detection systems and individual and collective protective measures -- to facilitate operations in a chemical environment and to counter new chemical threats. Both the DoD and the Congress recognize the need for a long-range, standoff chemical weapon system to preserve our deterrent, while negotiating for a global, verifiable ban on all chemical systems. Consistent funding and support from the Congress will bolster our position in the Geneva chemical arms control negotiations.

6. Low-Intensity Conflict

Low-intensity conflict will remain a major threat to our political and economic interests and moral values well into the 21st century. The President has defined low-intensity conflict (LIC) as "political-military confrontation between contending states or groups below conventional war but above the routine, peaceful competition among states. It involves protracted struggles of competing principles and ideologies. Low-intensity conflict ranges from subversion to the use of armed force. It is waged by a combination of means employing political, economic, informational, and military instruments. Low-intensity conflicts are often localized, generally in the Third World, but contain regional and global security implications."

Low-intensity aggression threatens to isolate the United States and its allies gradually from the Third World and from each other by imperiling democracy; flouting the rule of law and respect for human rights; and precipitating large-scale migrations of refugees. Its consequences can involve the loss of access to strategic minerals and energy sources; loss of military basing, transit, and access rights; and the gradual accommodation of friends and allies with states or groups hostile to the United States.

In the postwar era we have seen China, Cuba, Laos, Cambodia, Vietnam, and Nicaragua succumb to the revolutionary warfare strategems of communist insurgency movements. Similarly, we have witnessed the willingness of Moscow and its clients to deploy their forces to establish or prop up regimes in Afghanistan, Angola, Cambodia, and Ethiopia. Added to this has been the increase in lawlessness and violence brought about by terrorists and drug traffickers, equipped with modern weaponry and uninhibited by traditional norms of civilized conduct.

While our strategy of deterrence has provided us with an effective shield against overt aggression, it has not precluded hostile forces from resorting to ambiguous aggression to achieve their goals. Our enemies disguise their activities to maximize doubt and confusion about their intentions, then hide behind false fronts, diplomatic niceties, and international law. America's respect for the rule of law generally constrains our response in circumstances where we do not have incontrovertible evidence. Unfortunately, our enemies feel no such obligation. Therefore, we face conceptual and institutional challenges in comprehending, confronting, and defeating the threat posed by low-intensity aggression. This is not solely, or even principally, a military problem. Rather, it demands a cooperative effort from government agencies and the Congress, and the support of the American people.

While we deter and defend against this type of aggression, we must simultaneously address its underlying causes. We must help threatened nations help themselves through humanitarian aid, civic action, psychological operations, and security assistance to remove conditions under which revolutionaries, terrorists, and insurgents are spawned. Promoting economic growth and land reform, increasing political participation, and eliminating government corruption and inefficiency are efforts we can support to preempt the causes espoused by terrorists and insurgents. We also can minimize the threat of subversion by promoting respect for democratic values and institutions through security assistance, training and exchange programs, and participation in public diplomacy. Thus, a well-directed program of economic, security, and political assistance can strengthen a country's democratic roots, and help it resist the destabilizing forces of poverty, subversion, or radical insurgency.

Similarly, we must support selected insurgent movements struggling against totalitarian oppression. Afghanistan shows that these movements can succeed when the conditions are right and when consistent support is provided. Elsewhere, freedom-loving peoples have taken up arms against totalitarian regimes to secure liberty for themselves. We must have a durable consensus in the United States, and among our allies and friends, to support anti-Marxist insurgents whose goals are compatible with those of free, democratic states. This will help us to avoid erratic surge-and-starve support levels that raise doubts among friends and adversaries alike regarding America's will to defend its interests.

Despite our best efforts, however, at times our attempts to combat low-intensity aggression through preventive measures may fail. In such instances, we must be prepared to employ our military strength assertively, yet selectively. For example, the United States'

rescue operation in Grenada, where communist subversion helped topple the local government, led to a restoration of democracy. Furthermore, a collective response to low-intensity aggression is our best assurance of maintaining our security, as seen today in the efforts of the United States and many of our allies in preserving the right of free navigation in the Persian Gulf.

a. Insurgency and Counterinsurgency

After World War II the world entered a period of rapid change and considerable turmoil. The old European order was collapsing and new states were emerging from the dissolution of old empires. This upheaval engendered political, social, and economic problems which inhibited the formation of a stable political order. In the midst of this ferment, many groups, some guided by communist ideology, seized power through insurgent warfare. The goal of these communist groups was to establish a new political order based on the totalitarian Marxist-Leninist model. Cambodia, Nicaragua, Cuba, and Vietnam illustrate the fate of nations that have succumbed to a communist insurgency. El Salvador and the Philippines, among others, now face similar threats.

Today the Soviet Union and Cuba continue assisting communist insurgents worldwide. In responding to these threats, our role is to assist others in defending themselves. We must train host nation forces in the technical skills needed to accomplish their mission, and we must work with the leadership of these countries to help them along the road to competent, just civilian government. Security assistance is one of our most potent instruments for assisting our friends and allies in achieving the internal security essential to the growth of democratic institutions.

Illegal drug trafficking is another aspect of many insurgencies. The substantial revenues produced, and the concomitant exploitation of international financial networks that facilitate instability and insurgency, must be dealt with as integral elements of our low-intensity conflict strategy. We must work with affected countries to curb the drug trade and resist the political disruption and violence associated with large-scale drug trafficking. This calls for bilateral assistance as well as multilateral involvement in a war against the menace of narcoinsurgents. To combat drug trafficking, DoD supports other governmental agencies consistent with our requirement to maintain wartime readiness.

b. Peacetime Contingency Operations

To protect our interests at the lower end of the conflict spectrum, we must be prepared to conduct politically sensitive peacetime contingency operations of limited duration short of conventional war. Examples of contingency operations are military strikes, demonstrations, and shows of force.

Today we possess a potent range of capabilities from special operations forces through general purpose forces trained to respond immediately to aggression. Our willingness to deploy, and when necessary, to use force in Grenada, Libya, Honduras, and the Persian Gulf has enhanced our position in the world community. The judicious use of military force, coupled with other initiatives involving our allies and friends, has contributed significantly to the decline of Libya's overt use of terrorism and to the reduced tensions in the Persian Gulf.

c. Peacekeeping Operations

As part of our commitment to preserve peace we have deployed our forces to participate in peacekeeping activities. Our objective is to separate belligerents to allow time for the instruments of negotiation to find peaceful solutions to some of their long-standing problems. Today, for example, U.S. Army units are deployed in the Sinai as part of our effort to promote peace in the Middle East.

The United States also provided limited logistic support for the United Nations Observer Group in Iran and Iraq. Our participation in such U.N.-sponsored multinational peacekeeping operations is likely to increase substantially in the next few years. We are now committed to a significant support role in the expected U.N. Transition Assistance Group for Namibia, and are likely to assist with logistic support in U.N. conflict resolution efforts in Afghanistan, and possibly in the Western Sahara and Cambodia.

d. Counterterrorism

We have made significant strides in countering terrorism by developing and sustaining our intelligence penetration capabilities and our ability to defend against terrorist attacks. For example, we have developed and maintain a Counter-Terrorist Joint Task Force (CTJTF) and special operations forces to respond to specific situations. These forces can be augmented by selected general purpose forces to assist in countering the terrorist threat. We have also developed new initiatives to bring terrorists to justice and to convince their supporters to abandon them.

Significant progress has also been made in securing the cooperation of friendly nations. The timely exchange of intelligence information has preempted some terrorist attacks and led to the apprehension of several key terrorist figures. In sum, we have created an environment that makes it far more difficult for terrorists to survive and succeed.

7. Supporting Defense Policies

a. Collective Security

United States strategy is fundamentally a coalition strategy. America's security objectives cannot be achieved apart from the security of our friends abroad. Our defense policies, military strategies, and forces are largely integrated with those of our allies and friends. Our defense posture presents potential aggressors with a more formidable deterrent, while enhancing our ability to defend our collective interests should deterrence fail. The efficiencies achieved through cooperation keep our common defenses affordable as well. The various components of our collective security system are discussed in the next chapter.

b. Arms Control

Arms control is not an end in itself; rather, it complements our strategy of deterrence by increasing stability, constraining the threats to our security, and lending more predictability to our military requirements. For a detailed discussion, see Chapter 1.E.

c. Intelligence

Deterring the Soviets and other potential adversaries requires careful assessments of their interests, perceptions, capabilities, and intentions. To make these assessments, we depend on timely access to, and use of, strategic and tactical intelligence. Effective intelligence is required to verify and monitor Soviet compliance with existing and prospective arms control agreements and confidence-building measures. Our intelligence capabilities also must provide our political leadership with sufficient early warning of aggression to respond as needed to preserve the peace, or to order any military response that may be required. Should deterrence fail, military operations will require detailed and timely intelligence concerning the location, strength, and composition of hostile forces. To fulfill all these requirements, we possess a wide array of sophisticated assets for collecting, processing, and communicating intelligence information for decisionmakers and military commanders. Chapter III.G describes these programs in detail. Finally, combatting low-intensity aggression -- terrorism, subversion, insurgencies, and drug traf-

ficking -- requires a greater reliance on human intelligence support than do other forms of conflict.

Safeguarding our information from hostile powers is an indispensable complement to our intelligence programs. Extensive Soviet and other hostile efforts at intelligence penetrations, espionage, and acquisition of our military technology present a unique threat, as the "spy cases" of recent years demonstrate. We have increased our efforts to counter this threat, especially by strengthening physical and personnel security plans and programs to protect against hostile penetration.

d. Space-Based Systems for Deterrence and Defense

A major development in the 1990s will be the increased use of space-based systems. As noted in Chapter 1.B, these systems will exploit revolutionary changes in material substances, information processing, and other technologies. Such developments will go beyond those associated with strategic defenses to affect significantly our global and theater defense capabilities.

Given the Soviets' treatment of space as yet another medium in which to pursue their military competition with the United States, we must take steps to meet this challenge to our security. First, the United States must maintain a robust, reliable, and flexible space launch capability. Second, we must develop an effective ASAT capability to deter Soviet attacks against our space assets. Third, we must continue to make our satellites and their associated ground systems more survivable to attack. Fourth, we should examine maintaining some land-based systems to augment our space capabilities while developing an austere capability to replace destroyed satellites rapidly. An expanded discussion of our space programs is provided in Chapter III.J.

e. Dialogue with the Soviet Military

In the past year the Administration has opened a dialogue with the Soviet military establishment. There have been three meetings at the defense minister level; a separate visit to the Soviet Union by the Secretary of the Air Force; a visit to the United States by the Chief of the Soviet General Staff; and other contacts.

We desire a greater dialogue with the Soviet defense establishment, at all levels and on the basis of reciprocity, for the following reasons:

- To gain a better understanding of Soviet policy, personnel, and capabilities.

- To establish a productive dialogue on Western concerns about Soviet defense policies, including the

reduction of dangerous incidents involving our forces.

- To influence Soviet behavior regarding our security objectives by demonstrating the capabilities of our forces and increasing their understanding of U.S. defense policies.

- To encourage the Soviet Union to move toward greater openness in its defense policies, planning, budgets, and activities.

- To support U.S. and allied positions in formal negotiations.

We are pursuing this dialogue within the framework of the four-part agenda on U.S.-Soviet relations: human rights, regional conflicts, arms control, and bilateral relations.

In our discussions, we have addressed three major defense issues. First, to avoid future dangerous incidents, such as the Soviet shooting of members of our Military Liaison Mission in East Germany, we have agreed to establish a Joint Military Working Group on dangerous military activities. Second, we have discussed Soviet military doctrine. The Soviets state that they have shifted to a defensive military doctrine. We are watching closely for manifestations of this doctrine

and evidence of any change in the offensive orientation of Soviet forces. For example, they have changed the script of some of their exercises. Yet to date we have witnessed no diminution in the resources devoted to the Soviet military which, during the last three-and-a-half years under Gorbachev, have continued to increase at 3 percent annually in real terms and now equal 15-17 percent of Soviet GNP (see Chart I.C.3). Third, we have discussed increased military contacts, which resulted in high-level visits by U.S. and Soviet defense officials; implementation of a two-year program of military activities developed by the Chairman of the JCS and Chief of Soviet General Staff; increased access for our respective attaches; and other contacts.

We have also discussed other issues, including arms control, regional issues, and even human rights, while fully adhering to the position that these are discussions only and not negotiating fora. I believe our dialogue with the Soviet military has been constructive and can prove beneficial in the future.

8. Competitive Strategies

a. Introduction

Competitive Strategies (CS) is designed to be an effective analytical tool for long-range planning, and helping make difficult resource allocation decisions.

A Comparison of the Defense Fraction of U.S. GNP with the Estimated Defense Fraction of Soviet GNP

Chart I.C.3

*Data for 1988 are based on preliminary estimates.
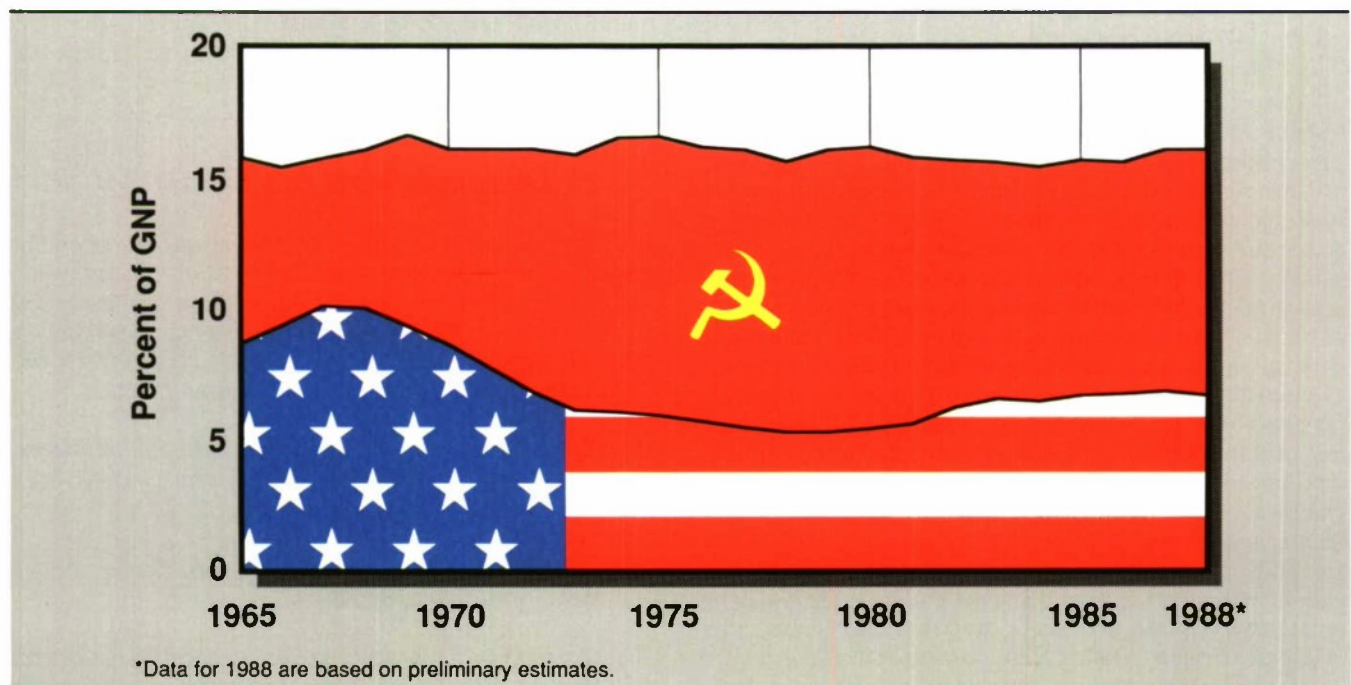
Since my last report, we made significant progress toward further defining and institutionalizing CS in the Department. The CS rationale has been incorporated as one of the general principles of policy within our Defense Guidance. Beyond the active involvement of the OSD agencies, the Services, and the Joint Staff, the unified and specified commands have expanded their participation in the CS process. Further, the CS concept and methodology have been discussed within the interagency arena (including Congress and the Executive Branch) and previewed to our NATO allies. During 1988, our CS efforts centered primarily on evaluating the recommendations of our first task force, which examined Competitive Strategies for Europe. In addition to our ongoing review of Task Force I's recommendations, we established Task Force II in July 1988 to address nonnuclear strategic capabilities. The following is an overview of the progress we are making in the Competitive Strategies Initiative (CSI).

Competitive Strategies is a method of strategic thinking for evaluating national defense strategy in terms of our long-term relations with the Soviet Union. Its objective is to enhance U.S. and allied security through a more effective deterrent capability. Competitive Strategies aims at identifying, developing, and prioritizing key U.S. defense efforts that can shape, in a positive way, the pace and direction of superpower military competition. The objective of CS is not to bankrupt the Soviet Union or undermine its economy. Instead, we are striving to get the most from our own defense resources, and to influence the way the Soviets allocate theirs, to minimize the threat they pose to our interests. CS is not new or revolutionary. The idea has always been implicitly a part of DoD thinking. However, with the realization that the Soviets were outspending us markedly in defense investment, three years ago the Department began to take steps to make it more explicit and less intuitive by institutionalizing and systematizing the concept.

A competitive strategy analysis employs a three-step, chess match methodology designed to align enduring U.S. strengths against enduring Soviet weaknesses in a move-countermove-countercounter-move sequence. This process seeks to arrive at a new or improved U.S. military capability derived from a combination of innovative operational and doctrinal concepts, alternative organizational approaches, and superior weapon systems and technologies. Competitive Strategies, however, is not a substitute for the "basics" (i.e., sustainability, infrastructure, C³I, etc.); it serves as a complement to -- not a replacement for -- other defense planning and existing alliance arrangements (e.g., our planning, programming, and budgeting system (PPBS), NATO's flexible response, etc.).

b. Progress

(1) Task Force I Candidate Competitive Strategies

In my last report, I highlighted the recommendations of Task Force I. They are summarized below:

- *Countering Soviet Air Operations:* The task force recommended that the United States enhance its capabilities to respond to a Warsaw Pact attack by countering Soviet aircraft sortie generation. The task force concluded that this could be accomplished by developing the capability to conduct a phased attack on the Soviets' main operating bases and air infrastructure employing unmanned aircraft, manned aircraft, and long-range, highly accurate conventional missile systems. From a defensive air capability perspective, the task force recommended measures designed to strengthen the survivability and effectiveness of our air and ground forces, and to promote the integration of these operational capabilities.

- *Countering Soviet Penetration of Forward Defenses:* The task force recommended developing an integrated network of long-range, mobile weapons platforms, and target acquisition and command and control assets capable of engaging Soviet mobile targets beyond the range of Soviet artillery and multiple launcher rocket systems.

- *Countering the Soviet Troop Control System:* The task force recommended frustrating Soviet tactical operations by blocking their preplanned attack options and replanning capabilities. The task force suggested that by use of direct and indirect means (e.g., special operations forces), the Pact's ability to devise and execute its operations at the strategic-operational level could be degraded.

- *Countering Soviet Global and Multitheater Operations:* Finally, to exploit Soviet aversion to a multitheater, protracted conflict, the task force recommended developing a strategy for responding to Soviet aggression. The strategy calls for us to initiate operations in parts of the European theater, or elsewhere, where the Soviets may be at a comparative disadvantage.

(2) The Task Force Assessment Process

In November 1987, these four recommendations were briefed to the Competitive Strategies Council, which I chair. A viability and feasibility assessment of the task force proposals was then conducted by OSD

departments, the Joint Staff, the Services, and the CINCs. The assessment concluded that the task force's proposals, in general, were feasible, and that optimal results were achieved when the task force recommendations were employed as a whole. The council subsequently directed that before any implementation decisions could be considered, an analysis of the proposals' operational and fiscal implications was required. This supplementary analysis proceeded in two complementary directions.

First, the Competitive Strategies Senior Intelligence Committee (SIC) was directed to review the task force's work to determine the range of likely Soviet responses. The SIC assessment concluded that if fully implemented, the task force recommendations could enhance deterrence. Second, the council directed that a War Game Committee be established to validate the task force recommendations from an operational viewpoint. The War Game Committee was formed with representatives from the Joint Staff, the Services, and, because of the task force's area of study, the European Command. It was asked to:

- Determine the operational validity of the candidate competitive strategies, individually and in combination;

- Identify, for those proposals deemed valid, essential high leverage employment doctrines, concepts, organizations, systems, and technologies; and

- Develop data to support an informed investigation of the resource implications of the desired military capabilities.

Upon completion of their six-month study, the War Game Committee members concluded that applying the Task Force I recommendations would enhance deterrence. Based on the findings of the SIC and the War Game Committee, the Task Force I recommendations will be evaluated further by the OSD Staff, the Joint Staff, the Services, and the warfighting commanders in chief. The resulting recommendations will then be included in the Chairman's Military Net Assessment for Strategic Planning (CNASP). The CNASP will provide a process for evaluating candidate competitive strategies in conjunction with other U.S. strategic and operational alternatives. At each stage of this extensive evaluation process, we are seeking to ensure that we consider all the factors that can help us decide if we should implement the Task Force's recommendations.

(3) Task Force II

In July 1988, a second task force was convened to address the subject of U.S. nonnuclear strategic capabilities (NNSC). Task Force II includes members from OSD, the Joint Staff, each of the Services, and the Defense Intelligence Agency. Task Force II was directed to evaluate operational concepts capitalizing on our greatly improved capabilities in conventional munitions and long- range, highly accurate weapons, and the potential they hold for achieving our strategic goals in various conflict scenarios.

c. *The Future*

In an attempt to develop an overall intelligence context from which to approach Competitive Strategies (CS), the Senior Intelligence Committee is working on a thorough study of future Soviet defense policy. This analysis outlines the range and scope of possible changes that Chairman Gorbachev's programs (e.g., *perestroika*, *glasnost*, etc.) may have on Soviet defense developments and military doctrine through the year 2003. The study will provide a useful framework for investigating other CS topics.

Competitive Strategies are not truly competitive unless they are coordinated and collectively endorsed. While it is premature at this time to discuss in detail the potential applicability of CS to our mutual defense efforts, we have begun to brief our NATO allies. In addition, we will continue to brief Congress, the National Security Council, other government agencies, and industry on the philosophy behind, and progress of, the CSI.

Competitive Strategies offers a useful approach for assisting the Department (and, potentially, our allies) in developing defense policy, planning military forces, allocating defense resources, developing cooperative programs, assessing arms control proposals, and managing collective security matters. We will continue to apply the CS methodology across the spectrum of conflict to assist in identifying the most effective ways to employ our scarce defense resources. In this sense, CS may contribute to fiscal prudence as well as to the evolution of our strategic doctrine.

9. Conclusion

The defense policies and defense posture of the United States present no threat to any peaceful nation or entity. Our alliances with other open societies exist for expressly defensive purposes. To preserve our security, however, we must support our strategic doctrine of flexible response for deterrence and defense within a collective security framework. We must also be willing, when it serves our security interests, to enter into agreements with the Soviet Union and other states to enhance stability and reduce armaments. Finally, we must provide the means to deter or defeat aggression by establishing and maintaining a broad range of military capabilities.

D. COLLECTIVE SECURITY

1. Introduction

America's system of collective security, in which we have joined with other nations to defend our common values, has been a pillar of our national security policy for over 40 years. We rely on this network of alliances for two basic reasons. First, although the United States is a global power with worldwide interests, it is also an insular power. The Soviet Union, however, is a continental power that can threaten directly areas of vital American interest in Europe, the Far East, and the Middle East. Our collective security system allows us to join with our allies and friends in defending our common interests as far forward from the United States as possible. Second, this voluntary association of like-minded nations has a synergistic effect on our collective security in which the deterrent value of our combined strength exceeds the sum of its parts. Through treaties with allied nations, we have preserved the common defense at a much lower cost in lives and national treasure than would have been the case had America gone its own way in the world. We can only benefit by continuing to improve our security partnerships.

Improving our system of collective security will remain one of our primary national security challenges in the coming years, for several reasons. First, the Soviet Union is skillfully presenting a public image that it now represents a diminished threat to our collective security. Yet despite the potential significance of Chairman Gorbachev's announced force reductions, we do not know if the Soviets will agree to eliminate through negotiations the significant asymmetries in Soviet/Warsaw Pact forces that would remain should these reductions occur. Second, we foresee continued pressure to reduce America's defense budget, driven in part by the perception among Americans that our allies and friends are not doing enough to support the system of collective security. Third, we will face an increasing tendency on the part of some allies to take a selective approach to their responsibilities to our collective security. Recently, there have been demands that the United States reduce or eliminate its military presence in some countries, or that we pay a large "rent" in return for our presence. These demands ignore the mutual benefit of our being there. Ironically, these emerging problems stem, in part, from the success of our collective security arrangements, which have encouraged the Soviets to be more forthcoming in discussing our security concerns, and created the conditions for economic prosperity and the spread of democracy.

We cannot take for granted the coalition of free nations whose collective strength has made these successes possible. Our security relationships are not immutable, however; nor is change undesirable. On the contrary, we anticipate and welcome the prospect for positive change in a number of areas. I believe that meeting the security challenges of the 1990s will require significant changes in our alliance relationships. We must, however, manage these changes prudently, to enhance our individual and collective interests. This chapter discusses the current state of our collective security system, as well as what we are doing to build stronger relationships with our friends and allies for the future.

2. Regional Security

a. Europe / North Atlantic Treaty Organization

In April 1989 the North Atlantic Treaty Alliance between the democracies of Europe and North America will be forty years old. It was established as a defensive alliance of independent nations, dedicated to preserving the freedom, common heritage, and well-being of its people. The Alliance's purpose is to preserve peace by possessing sufficient military strength and political cohesion to deter an attack on any member of the Alliance or, if that fails, to defeat aggression and restore peace on favorable terms. Forty years of political stability and economic prosperity in the North Atlantic community are the measure of the Alliance's success. This success is rooted in our shared values and in a shared political, military, and financial commitment to the common defense.

(1) Interests, Challenges, and Risks

The freedom and security of Western Europe are vital to our security. With its large population and its advanced technological and industrial base, Europe remains the most important area of the world to the United States outside of North America. Western Europe represents the world's largest economic bloc, and the European Economic Community is pledged to remove all internal barriers to trade by 1992. Our economic systems are highly interdependent; for example, nearly one-half of our foreign investment is in Europe, and Europe is the source of nearly two-thirds of the foreign investment in the United States.

The Soviet Union remains the major threat to the security of Western Europe. The European countries of the Alliance occupy the fringes of a continental landmass dominated by the Soviet Union and its Warsaw Pact allies. They share a border with the Warsaw Pact

Europe

Chart I.D.1

LEGEND

- ☐ NATO
- ☐ Warsaw Pact

MILITARY ASSISTANCE
(FY 1988)

- ★ $100 - 500 Million
- ★ $10 - 100 Million
- ★ $1 - 10 Million

ª Federal Republic
of Germany

ᵇ German Democratic
Republic

ᶜ Berlin

The United States Government has not recognized the incorporation of Estonia, Latvia, and Lithuania into the Soviet Union.
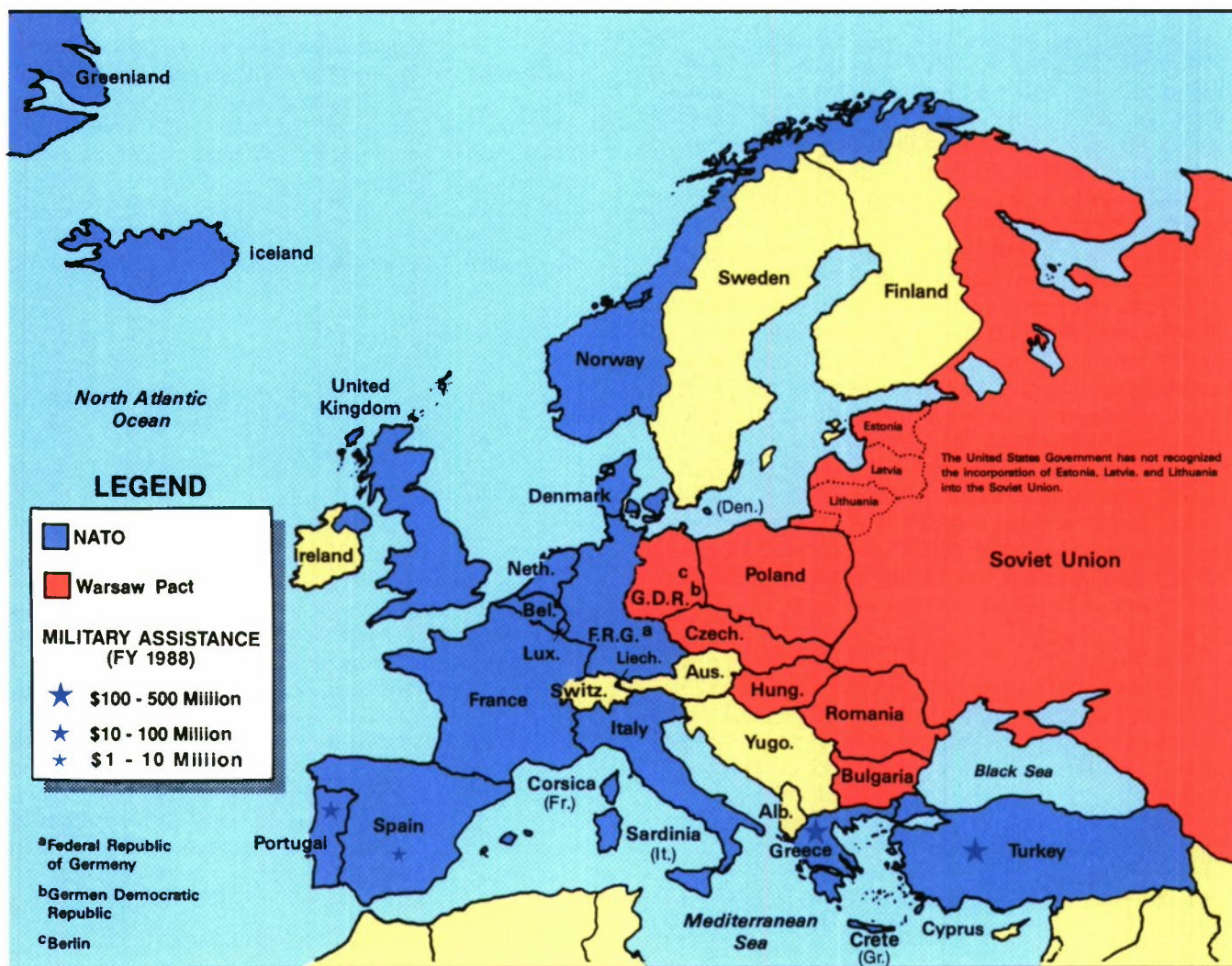
Boundary representation is not necessarily authoritative

that stretches from the Norwegian Arctic in the north, through Germany, to Greece and Turkey in the south. Between that border and the Ural Mountains, the Soviet Union and its allies deploy the great bulk of their military forces. These forces far exceed what is necessary to secure the Soviet Union's own defenses, substantially outnumber NATO's forces, and are deployed in a way that gives them a capability for surprise attack and large-scale offensive action against NATO. There is a widespread public perception that the threat has receded; yet the Soviet Union continues to produce large numbers of tanks, planes, and missiles. In sum, the threat to Western Europe's security has by no means diminished.

To meet the challenge of increased Soviet military capabilities, NATO must continue its nuclear and conventional force modernization programs. NATO nations also must ensure that Alliance security roles, risks, and responsibilities are shared equitably. With the growing economic strength of our European allies, the United States looks to an increasingly strong European role in the Alliance. Recent progress in this regard is discussed in the section on burdensharing.

(2) U.S. Military Capabilities

The United States maintains over 300,000 troops forward deployed in NATO Europe. These forces are a visible sign of our commitment to defend Europe, in-

cluding our nuclear commitment, and are an indispensable element of the overall NATO deterrent. They are under the command of the Commander in Chief, U.S. European Command (USCINCEUR), who also serves as the Supreme Allied Commander, Europe (SACEUR) for all NATO forces.

This past year, in the context of the burdensharing debate, there have been renewed calls for U.S. force withdrawals from Europe. Unilateral U.S. force reductions, however, would undermine the prospects for reciprocal force reductions in the forthcoming Conventional Stability Talks with the Soviet Union and its Warsaw Pact allies. In addition, such U.S. withdrawals would not begin to save money for a number of years, if ever, unless the withdrawn troops are demobilized. Any reduction of forward-deployed forces in Europe would strain our ability to meet our long-standing Alliance commitment to field 10 divisions with associated air support to Europe within 10 days. Finally, large-scale reductions would seriously weaken NATO's overall deterrent and defense capability, thereby endangering U.S. national security.

(3) Regional Cooperation

(a) NATO Defense Program

Our NATO defense program represents the U.S. contribution to the common defense. It is designed to strengthen NATO's strategy of flexible response and forward defense. While seeking increased defense efforts on the part of our allies, we must also ensure that we do not fall short in our own contributions. In particular, we must continue our programs that support the 1985 NATO plan for Conventional Defense Improvements (CDI) and the 1983 Montebello Decision on nuclear force modernization.

Conventional Defense: In May 1985, Allied Defense Ministers approved a plan for Conventional Defense Improvements. This plan, which was updated in May 1987, identifies critical deficiencies in conventional defense and calls for special efforts to overcome those deficiencies. As part of CDI, NATO approved a new set of high-priority force goals in 1988. Member nations have agreed to implement these goals, as with the prior set of CDI force goals approved in 1986. The United States has endeavored to set the example for other nations by implementing the CDI force goals assigned to us. The programs involved are wide-ranging and include efforts to improve, develop, and field effective systems in key areas like air defense and follow-on forces attack (FOFA). Another important part of our contribution to CDI described elsewhere in this chapter is expanded armaments cooperation.

Nuclear Planning: In October 1983, at Montebello, Canada, NATO Defense Ministers in the Nuclear Planning Group (NPG) decided to reduce the number of NATO's nuclear weapons in Europe by 1,400 while taking the steps necessary to ensure that the remaining nuclear forces are responsive, survivable, and effective. Together with a 1979 decision to withdraw 1,000 warheads without replacement, this decision has reduced the number of NATO's nuclear weapons in Europe by more than one-third. Implementation of the INF Treaty will lead to further reductions. At its April 1988 meeting, the NPG endorsed a step-by-step approach to restructuring NATO's nuclear forces following the withdrawal of INF missiles. In doing so, the NPG reviewed and revalidated the Montebello framework and reaffirmed its continuing support for national efforts to meet the requirements stemming from Montebello. At its October 1988 meeting, the NPG reviewed short-range nuclear forces in particular, and reaffirmed their role in Alliance deterrent strategy.

(b) Host-Nation Support, Cooperative Logistics, and Infrastructure

Cooperative programs are a prime means of sharing the common defense burden. These programs involve bilateral agreements with most of our allies for peacetime and wartime host-nation support of U.S. forces. Peacetime host-nation support includes the joint use of installations where the host nation provides the infrastructure and necessary improvements. Support in the event of war is often substantial. For example, Germany alone plans to provide 93,000 military personnel in wartime host-nation support of U.S. forces.

We have increased our participation in cooperative logistics programs through the NATO Maintenance and Supply Agency (NAMSA). Specific programs involve support for the multiple-launched rocket system (MLRS), the Patriot missile system, the AIM-9 missile system, calibration, and war reserve storage. NAMSA provides savings through increased competition, consolidated quantity purchasing, and centralization. In addition, we intend to participate in NAMSA's consolidated munitions procurement program, now beginning after completion of a successful pilot program.

Most of the wartime operational facilities required by U.S. forces assigned to NATO are provided by the common-funded NATO Infrastructure Program. Currently averaging some $2 billion, annual infrastructure programs fund a wide range of construction, including airfield facilities, pipelines, and base security systems. They support external reinforcements by providing storage for prepositioned equipment, materiel, and munitions, plus maintenance facilities. Additionally, the

program funds essential command, control, and communications systems used by all the allies. The program also provides common-use training facilities and equipment for NATO forces in peacetime. Continued congressional funding support for this program is critical. The allies now fund 73 percent of all program costs; furthermore, the total benefit provided to U.S. forces is consistently higher than our 27 percent share of the cost. These benefits were recently in evidence when NATO agreed to fund the relocation of 72 U.S. F-16 aircraft from Spain to Italy.

b. The Western Hemisphere

(1) Interests, Challenges, and Risks

We accord the highest priority defense planning to the defense of North America, the contiguous Caribbean Basin, and the adjoining air and sea lanes on which we depend. We and our allies and friends have a wide range of common security needs throughout our hemisphere; in meeting them, we cooperate closely with Canada, as well as with other allies to our south.

During the immediate post-World War II era, nations in the Western Hemisphere did not pose a serious threat to American security. This changed in the early 1960s with Castro's consolidation of power in Cuba and his export of revolution and subversion. This threat worsened in 1979 with the rise of the Marxist-Leninist Sandinista regime in Nicaragua, the first such regime on the American continents. Coupled with the economic and social problems elsewhere in Central America, the Sandinistas' assumption of power led many to believe that communism constituted the wave of the future for Central America. In recent years, however, the Marxist threat has been held at bay in El Salvador, Honduras, and Guatemala, largely due to United States encouragement and support.

Many serious challenges to our security remain. The Soviets, Cubans, and Nicaraguans have expanded their military capabilities in the region. Nicaraguan and Cuban defectors indicate that the expansion will continue. The Soviets and their allies are now in a position to threaten the Panama Canal, and to interdict our Caribbean Gulf ports and South Atlantic sea lines of communication. In the event of war, this would seriously impair our ability to obtain vital natural resources and to resupply our forces overseas. A second challenge to our security is the illicit cultivation, production, and trafficking of narcotics in Latin America, which supplies millions of American drug abusers. Powerful narcotics traffickers pose a serious threat to several countries in the Caribbean Basin and northern South America. A third concern is the re-emergence of major leftist insurgent groups in Colombia, Peru, and Chile, and the continuing insurgencies in El Salvador and Guatemala. The possible linkage of the Colombian and Peruvian insurgent groups with the drug trade makes them doubly threatening. A fourth challenge is the political crisis in Panama, currently in the midst of the Noriega/Solis regime's anti-U.S. campaign. Finally, economic problems threaten the stability of a number of states and may eventually give rise to military takeovers. Drug money has become a serious corrupting factor and may come to be seen in some countries as an acceptable source of government revenue. The inability of a number of countries to meet their debt obligations to the United States and other creditors could have a serious negative effect on several major U.S. financial institutions.

To meet these challenges, the Reagan Administration has worked to promote and consolidate democratic governments as an indispensable foundation of security in the Western Hemisphere. We have, for example, actively supported the democratic government of El Salvador against communist insurgents through a combination of military and economic assistance and diplomatic support. In seeking to lessen the threat posed by Nicaragua to its neighbors, we have supported the Nicaraguan Democratic Resistance and regional diplomacy. Perhaps most important, we have attempted to address the economic and social roots of regional instability by stimulating economic, social, and political development through the Caribbean Basin Initiative and economic assistance programs. Finally, we have used force when the adversaries of democracy have left no other alternative, as in Grenada.

(2) U.S. Military Capabilities

We have developed an effective military structure to protect our interests in the hemisphere. Land defense of the continental United States is the responsibility of Forces Command (FORSCOM), a specified command with over one million Active, Reserve, and National Guard personnel throughout the United States. The Commander in Chief, U.S. Space Command has responsibilities for space operations, surveillance and warning, and ballistic missile defense planning. The Commander in Chief, United States Southern Command (USCINCSO) is responsible for the more than 10,000 U.S. military personnel stationed in 19 of the 20 countries of Central and South America. Almost all of these personnel are based in Panama. The Commander in Chief, U.S. Atlantic Command (USCINCLANT), headquartered in Norfolk, Virginia, is responsible for the Caribbean and waters adjacent to Central and South America.

(3) Regional Cooperation

Military-to-military cooperation remains a vital part of U.S. hemispheric strategy. Coordination with

The Western Hemisphere

Chart I.D.2

LEGEND

MILITARY ASSISTANCE (FY 1988)

- $1 - 2 Billion
- $500 - 1,000 Million
- $100 - 500 Million
- $10 - 100 Million
- $5 - 10 Million
- $1 - 5 Million

Boundary representation is not necessarily authoritative

Note: The seven independent Eastern Caribbean nations together received $1 million in U.S. military assistance in FY 1988.

Canadian forces for the combined land defense of the United States and Canada is the responsibility of FORSCOM. USCINCSPACE serves as commander of the North American Aerospace Defense Command (NORAD), a U.S.-Canadian combined command fulfilling responsibilities for cooperative aerospace defense of the continent. Annually, USSOUTHCOM conducts military training exercises and deployments with regional friends and allies, while USCINCLANT conducts joint and combined exercises in the Caribbean, South Atlantic, and Southeast Pacific. Engineering training exercises are frequently held by U.S. Army, Reserve, and National Guard units in Central America. The roads, bridges, and other facilities built during these exercises contribute to the nation-building process in Central America.

To secure this foundation for the defense of U.S. security in the Western Hemisphere, we must continue to apply economic assistance and political suasion to the root causes of hemispheric instability: poverty, societal inequities, human rights abuses, and administrative inefficiency and corruption. In addition, security assistance will help fledgling democracies defend themselves against externally generated subversion and low-intensity aggression. For example, U.S. agencies involved in the war against narcotics have engaged their Latin American and Caribbean counterparts in joint operations. Close cooperation with Latin American governments has resulted in the arrest and extradition of leading narcotics traffickers. At the same time, we must sustain vigorous diplomatic efforts to resolve disputes peacefully. Building upon this comprehensive approach will require our continued attention, and increased levels of support above those prevailing in recent years.

c. East Asia and the Pacific

(1) Interests, Challenges, and Risks

The United States has extensive security interests in East Asia and the Pacific that have economic, political, and military dimensions. Our trade with the nations of the Pacific Basin continues to grow. The region is emerging politically, assuming a new position of international influence. Several states -- most prominently the Philippines and the Republic of Korea (ROK) -- are committed to a successful transition to democracy. China is continuing along the road to economic and political reform as well.

There are many challenges to the region's economic and political success, but the chief threat to peace and security stems from the continuing expansion of Soviet military power and influence in the area. In addition to increasing the capability of its eastern and Pacific forces, the Soviets are also seeking to erode U.S. alli-

ances through diplomatic means. Other challenges to American friends and allies also stem from Soviet-related sources. North Korea, with substantial offensive military forces and newly acquired advanced Soviet military hardware, remains a threat to South Korea.

In Southeast Asia, the United States is working closely with Thailand and other ASEAN states to help bring about a Vietnamese withdrawal from Cambodia and ensure Cambodian self-determination. Despite recent improvements, the Philippine economy remains fragile and vulnerable to a continuing communist insurgency that threatens Philippine democracy. The United States strongly supports the successful restoration of democratic institutions in that country, and the continued success of its elected civilian government. The suspension of our security obligations to New Zealand, resulting from that government's ban on U.S. naval ship visits, presents a continuing challenge to regional security in the South Pacific.

(2) U.S. Military Capabilities

Reflecting our long-standing concern for the security of this region, we maintain active mutual security agreements with Japan, the Republic of Korea, the Philippines, Thailand and Australia, as well as non-treaty security ties with other countries in the region. The close proximity of Soviet forces, and those of their clients, to U.S. allies and friends in the region requires us to maintain an ability to respond in a timely fashion. To meet such demands we maintain ground, air and naval forces in Japan and Korea, and naval and air forces in the Philippines, plus naval carrier battle groups and Marine expeditionary forces in the Western Pacific. The U.S. Commander in Chief, Pacific (USCINCPAC), with headquarters in Hawaii and ground, air and naval forces spread across half the earth's surface, has military responsibility for U.S. military operations in East Asia, and in the Pacific and Indian Oceans.

(3) Regional Cooperation

The success of the U.S. strategy of deterrence and forward deployment rests on military cooperation with many countries in the Pacific. Several countries are particularly important in this regard:

Japan: As the cornerstone of U.S. defense policy in the region, Japan provides a formidable defensive shield challenging Soviet access to the Pacific. Japan has pledged to defend its territory, airspace, and sea lines of communication out to 1,000 nautical miles, and is making solid progress towards this goal. Japan no longer limits defense spending to a designated percentage of GNP, but rather seeks to fulfill its defense goals in response to the threat within the context of

East Asia and the Pacific

Chart I.D.3

Soviet Union

North Pacific
Ocean

Mongolia

Japanese Northern Territories
Occupied by Soviet Union Since 1945

N. Korea

Indian Claim

People's Republic
of China

S. Korea

Japan

Chinese
Line of Control

Taiwan

Burma   Laos

Hong Kong (U.K.)
Macau
(Port.)

Thailand

Cambodia

Philippines

Vietnam

Brunei

Indian Ocean

Malaysia
Singapore

Solomon Islands

Indonesia

Papua
New Guinea

Vanuatu

LEGEND

South Pacific
Ocean

MILITARY ASSISTANCE
(FY 1988)

Australia

$1 - 2 Billion

$500 - 1,000 Million

$100 - 500 Million

$10 - 100 Million

$5 - 10 Million

New
Zealand

$1 - 5 Million

Boundary representation is not necessarily authoritative

domestic and regional political constraints. The United States, in providing a nuclear umbrella and offensive strike capability in the northwest Pacific, works closely with Japan on key issues such as interoperability and sustainability, steadily increasing our defense partnership.

China: Our developing defense relationship with China is based on common security interests. A secure, modernizing China can be a force for peace and stability in East Asia and the world. Recognizing that China is a friend, the United States has sought to play a positive role in China's defense modernization. We will continue to pursue high-level dialogues, functional military exchanges, and military-related technology cooperation in areas of mutual interest. In doing so, we also will take into account the interests of other friends and allies in the region.

Korea: After hosting a peaceful and successful 1988 Summer Olympics, the Republic of Korea has demonstrated that its economic success is matched by its rapid political maturation. South Korea, however, still faces an imposing North Korean military threat. Therefore, ROK and U.S. forces continue to modernize their ground, air and naval capabilities and to improve their interoperability and sustainability. Nevertheless, both the United States and the Republic of Korea remain committed to exploring ways to reduce tensions on the Korean peninsula.

Thailand: As a long-time friend and treaty ally, the United States has supported Thailand with a range of programs to modernize and improve the Royal Thai Armed Forces. Our programs are designed to enhance Thai logistical preparedness, increase ground forces' tactical mobility, expand naval capabilities beyond coastal patrol, and create an air defense system that is interoperable with U.S. systems. We participate in combined joint exercises, and provide U.S. military equipment and training under our security assistance program. We also are implementing the 1987 War Reserve Stockpile Agreement, under which each nation will establish and maintain war reserve stocks in Thailand for emergency use. Unfortunately, reductions in security assistance funding jeopardize our gains in building security cooperation with Thailand. The United States also continues to furnish modest non-lethal aid to the noncommunist resistance forces seeking to liberate Cambodia from Vietnamese domination.

Philippines: Our long and enduring security relationship with the Philippines is based on our Mutual Defense Treaty of 1951 and the Military Bases Agreement of 1947. Our alliance is grounded in mutual recognition that Philippine security strongly influences regional peace and stability. The presence of U.S. forces at Clark Air Base, Subic Bay Naval Base, and other smaller installations in the Philippines constitutes our military contribution toward preserving our common interests of peace and security. Our security assistance program is designed primarily to help the Philippine armed forces defend their nation. At present, this involves combatting the communist insurgency that threatens the democratic gains of the 1986 revolution. The successful base agreement review completed in October 1988 will ensure continued U.S. economic and security assistance for the Philippines through 1991.

Australia: The regional stability previously provided by a trilateral ANZUS alliance now depends on the strong and growing bilateral security relationship between the United States and Australia, which yields mutual benefits. For the United States they include: port visits by U.S. warships; special arrangements for aircraft operations; access to excellent training areas; use of a variety of Joint Defense Facilities; and an opportunity to cooperate with a close and trusted ally on a wide spectrum of security-related issues. Our alliance with Australia is, and will remain, an equal partnership based on shared goals and interests.

d. The Near East, South Asia, and North Africa

(1) Interests, Challenges, and Risks

The United States has had critical national interests in this region for over four decades. They include denying the Soviets access and influence which might threaten free world access to energy resources; assuring the stability and security of friendly states, especially those critical to oil access; inhibiting the escalation or spread of armed conflicts; and reaching a just, peaceful, and enduring settlement to the Arab-Israeli conflict.

Challenges to U.S. interests are numerous: armed conflict in the Western Sahara; aggression by Libya against Chad; the Iran-Iraq War; the remaining Soviet presence in Afghanistan; and, most recently, border clashes between South Yemen and Oman. These conflicts jeopardize political and economic progress, create opportunities for expanded Soviet influence, and endanger Western access to regional oil resources. Despite the recent agreement to end the Iran-Iraq War, U.S. interests in the Gulf region are still threatened by the possibility of renewed open conflict.

To counter these threats and safeguard our interests, the United States has a two-pronged strategy. The first element is a vigorous diplomatic effort to end open conflicts and tensions quickly and peacefully. Second, we also are continuing our long-standing secu-

The Near East, South Asia, and North Africa

Chart I.D.4

LEGEND

MILITARY ASSISTANCE (FY 1988)

■	$1 - 2 Billion
■	$500 - 1,000 Million
■	$100 - 500 Million
■	$10 - 100 Million
■	$5 - 10 Million
■	$1 - 5 Million

*Israeli occupied—status to be determined
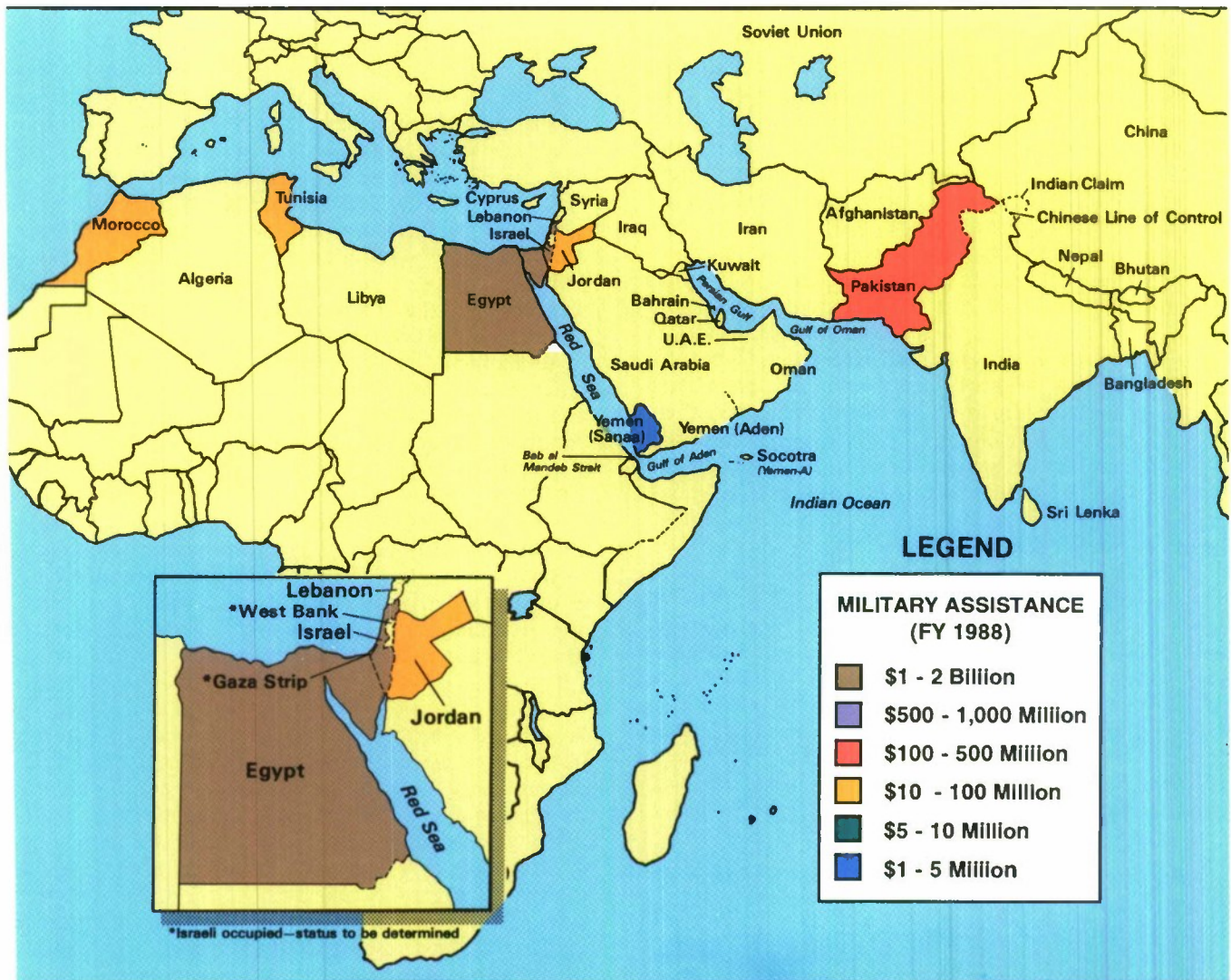
Boundary representation is not necessarily authoritative

rity assistance and defense cooperative efforts with friends in the region. In 1987 we agreed to reflag 11 Kuwaiti tankers, and we continue to provide them and other U.S.- flag vessels protection in the Persian Gulf through an increased U.S. naval presence.

(2) U.S. Military Capabilities

Geographic military responsibility for the region is distributed among the commanders of three unified commands: European Command, responsible for most Mediterranean littoral countries; Central Command, responsible for Southwest Asia; and Pacific Command, responsible for South Asian countries east of Pakistan.

Following the decision to reflag Kuwaiti tankers, we created the Joint Task Force Middle East (JTFME) in the Persian Gulf to provide essential command and control for our increased naval presence, including the U.S. Middle East Force (MIDEASTFOR) which has been stationed in the Persian Gulf for nearly 40 years. Adequate levels of U.S. general purpose forces are available in the event of a regional crisis. Clearly, however, a timely and effective U.S. response to military threats will hinge on non-treaty relationships with friendly states for rapid force deployment and resupply, access to local facilities and support, and assistance from local military forces.

(3) Regional Cooperation

Near East: Our extensive security assistance relationships with Egypt and Israel have increased our ability to respond to crises in the Eastern Mediterranean. During the past eight years the United States has expanded its bilateral military relationship with each country. Israel has emerged from a difficult period following the cancellation of the Lavi tactical fighter program with a robust new modernization and acquisition program. Our assistance to Israel during this period was decisive and quite successful. Israel's defense programs will still face resource constraints, but many vital procurement and development programs once threatened by the high cost of the Lavi can now move forward. Generous U.S. assistance over the last eight years has dramatically enhanced Israel's military security, while great strides taken in strategic cooperation have improved an already close and mutually beneficial relationship. Egypt will use U.S. assistance to finance a tactical fighter program and develop the capability to co-produce the M1A1 tank. Large U.S. and Egyptian forces continue to participate in major military maneuvers, which exercise U.S.-funded ranges and maintenance facilities. Jordan, a long-time friend of the United States, has played a quiet but pivotal role in regional security. However, our military-to-military relations with Jordan now stand solely on our modest exercise program, military training, and a level of assistance which is inadequate even to maintain the U.S. equipment we have already provided. Due to a steady decline in U.S. assistance to Jordan -- from $115 million in FY 1984 to $26.5 million in FY 1988 -- we are in danger of having our influence supplanted by the Soviets.

Persian Gulf: The U.S. and allied presence in the Persian Gulf has played a significant role in bringing Iran and Iraq to the negotiating table. The resolve displayed by the United States, supported by its European allies and friendly local Arab states, ensured that the region's oil continued to flow through the Strait of Hormuz. Our long-term presence saw our forces assert the principle of freedom of navigation; escort U.S.-flagged vessels; provide distress assistance to neutral shipping; clear mines from shipping lanes; and repel repeated Iranian gunboat and missile attacks. These sustained operations clearly improved our economic, political, and military ties to friendly Arab countries.

South Asia: South Asia is in an important transition period, following the Soviet decision to withdraw from Afghanistan and the tragic death of Pakistani President Zia. The continuing insurgency in Sri Lanka, which prompted Indian military intervention in 1987, also remains a source of concern. Our balanced policy on the subcontinent has improved our relationship with both Pakistan and India.

Pakistan continues to play a key role in our efforts to oppose Soviet aggression in Afghanistan. We strongly supported Pakistan's firm opposition to Soviet presence in Afghanistan, a policy that has clearly succeeded in forcing the first Soviet withdrawal from occupied territory in over 30 years. While the Soviets have withdrawn over half their forces from Afghanistan following the Geneva Agreement of last April, many occupation troops remain. The Soviets are continuing to aid the Kabul regime militarily, both logistically and operationally, and are persisting in their attempts to intimidate Pakistan by repeated border incursions and air raids. Furthermore, the Soviet-trained and organized Afghan Secret Service has been carrying out a campaign of terror on Pakistani soil against Afghan refugees and the Pakistani populace, which has left more than 220 dead and 1,000 wounded. Their aim is to undermine Pakistani support of the Afghan resistance. We are continuing our strong security assistance and defense industrial relationship with Pakistan as it continues its development of resilient democratic institutions.

We also are continuing to develop our security cooperation with India, the region's preeminent power, through training visits; technical exchanges; attendance at exercises and service conferences; sales of materiel; and technological assistance for a variety of defense production projects.

North Africa: The United States has long-standing security relationships with Morocco and Tunisia that involve a close dialogue on a full range of military requirements; a strengthening of military capabilities through equipment purchases and training; and, potentially, greater access and transit rights for our forces during crises. We have also begun a productive dialogue with Algeria on expanding our security cooperation relationship to lessen Algerian dependence on Soviet and Eastern-bloc countries, and to encourage closer ties with the West.

e. Sub-Saharan Africa

(1) Interests, Challenges, and Risks

While Africa has changed greatly in the 1980s, U.S. defense interests there have been remarkably stable: continued free world access to the continent's mineral riches; decreased Soviet influence; economic, social and political development and military stability; and constructive development of our relationships, including occasional access to military facilities, to support operations during Middle East or Southwest Asia contingencies.

At the start of the decade, much of Africa faced grave challenges. Economies staggered under the accu-

Sub-Saharan Africa

Chart I.D.5

LEGEND

MILITARY ASSISTANCE (FY 1988)

- $1 - 2 Billion
- $500 - 1,000 Million
- $100 - 500 Million
- $10 - 100 Million
- $5 - 10 Million
- $1 - 5 Million
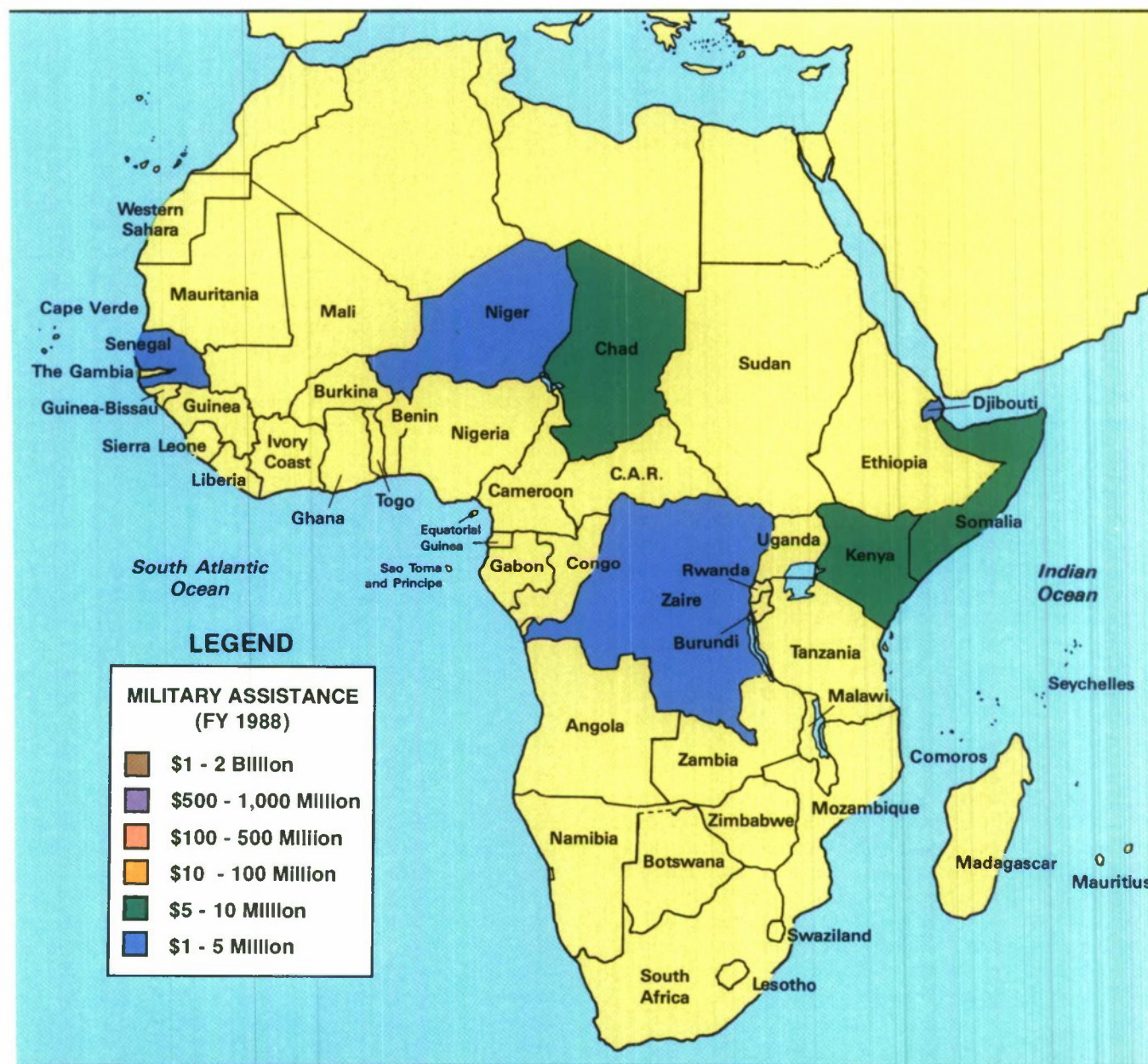
Boundary representation is not necessarily authoritative

mulated weight of chronic mismanagement and excessive central government control. Ethnic animosities, drought, and cross-border violence between South Africa and its neighbors pushed the continent toward social chaos. Qaddafi pressed Libya's aggressive claims against its neighbors, with Libyan troops occupying major portions of Chad. The Soviets were still extending their influence with large arms shipments to Ethiopia, Mozambique, and Angola.

The United States responded to these challenges with a balanced program of economic and military support for selected African nations. On the economic side, we funded programs to alleviate Africa's social problems, and worked with other donors to convince governments to move toward market economies. During the

past four years, for every dollar spent to support defense requirements, we sent at least seven dollars in economic aid. On the military side, we used limited military assistance and military education and training to help African governments meet legitimate defense requirements. We conducted joint training exercises with several nations and where appropriate, as in Chad, we compounded our limited investments in military assistance by coordinating efforts with our European allies. As always, we encouraged negotiated settlement of outstanding conflicts.

Partly because of these policies, there has been progress in many areas. Across the continent governments are turning to market-oriented economies. The Chadians' resounding defeat of the Libyans -- including the capture of as much as $1 billion in Soviet-manufactured equipment -- helped distract Qaddafi from his terrorist spree in Europe and the Middle East. Changes of government have made it possible to increase U.S. influence in several countries with Soviet ties, especially through our program for African Coastal Security (ACS), which helps selected littoral states improve their control over their coastal waters and maritime resources. The program has sensitized nations such as Guinea and Guinea-Bissau to the environmental and economic costs of not protecting their coastal waters from unbridled foreign -- including Soviet -- exploitation. Most importantly, negotiations have been completed to withdraw Cuban troops from Angola and grant independence to Namibia. Successful implementation of these agreements should open new opportunities for economic development and stability throughout Southern Africa.

While the stage is set for progress in some areas, formidable challenges remain in helping Africa cope with economic decline and new calamities such as the AIDS epidemic. Only through continued economic and military aid can the Africans preserve the gains of recent years and avert new setbacks. We also must remember that future challenges to America's security and interests will likely emanate from low-intensity conflicts in developing regions such as Africa.

(2) U.S. Military Capabilities

Three unified commands share U.S. military responsibilities for Africa: Central Command is responsible for the strategic Horn of Africa (Kenya, Somalia, Sudan, Djibouti, and Ethiopia); European Command for the bulk of the continent; and Pacific Command for the four Southwest Indian Ocean island nations (Madagascar, Mauritius, Seychelles, and Comoros). Just under 400 U.S. military personnel are assigned to the continent at any one time -- more than half of whom are Marine embassy guards, with attaches and security assistance personnel comprising the remainder.

The United States has no bases or troops in Africa, but our forces do occasionally conduct exercises in Africa and make visits as operational requirements dictate.

(3) Regional Cooperation

Africa adjoins two areas of prime importance to U.S. national security: NATO's southern tier and the Middle East. As events with Libya have shown, instability in Africa can wash north onto NATO's shores. Conversely, stable, friendly governments in Africa can play an important role in protecting U.S. interests. By according the United States access to key military facilities, the Horn nations help protect our interests in Southwest Asia. The recent crisis in the Persian Gulf showed the substantial returns paid by small investments in security assistance for the Horn. Similarly, the West and Central African nations that permitted us intermittent access for the supply of Chad were also indirectly supporting the security interests of our European allies. To encourage the continuation of such cooperation, the United States will help friendly African governments deter -- and if necessary, contain -- aggression.

Security assistance, however, is our primary tool for conducting defense cooperation, and it is in increasingly short supply. Paradoxically, as U.S. relationships with African militaries are maturing and as threats from Third World sources are increasing, our military assistance funding for Africa has plummeted from a high of almost $200 million in FY 1982 to the FY 1988 level of $35 million. Although presidential emergency funds helped sustain our programs in Chad, and exercises, VIP visits and Title X monies provide some help, we must reinvigorate regular, dependable bilateral assistance, or rational joint defense planning becomes impossible. FY 1990 is critical to our security assistance efforts for three reasons. First, the United States must renegotiate access agreements with both Somalia and Kenya. Without substantial increases in assistance we will be unable to meet even our minimum commitments to these countries. Second, we must continue our support for the United Nations peacekeeping effort in Namibia, and prepare for our future relations with an independent Namibia. Third, we need adequate funds to sustain and broaden regional cooperative initiatives with our European allies, especially in force sustainment and nation-building activities.

f. Humanitarian Assistance

The DoD Humanitarian Assistance Program continues to make a significant contribution to U.S. security interests worldwide. The components of this program are increasingly important as funding levels for foreign and security assistance continue their decline. Disaster assistance, primarily the airlift of relief

supplies to such disaster-stricken areas as Bangladesh, Jamaica, and Central America is an ongoing contribution made by the Department of Defense under Agency for International Development (AID) auspices. Our excess property donations have, since March 1986, been channeled to 13 countries and numerous private voluntary organizations. For example, we have flown over 75 relief missions to the Afghan people carrying sleeping bags, cold weather clothing, medical equipment and supplies, personal gear, food, fuel bars, and pack animals, and we have airlifted some 620 wounded Afghans to the United States and Europe to receive free advanced medical care. Our Humanitarian/Civic Assistance projects are carried out in all regional unified commands by U.S. forces working closely with Third World host country military personnel. These projects are closely coordinated with the State Department and AID, and include health, dental, and veterinary care; road construction and repair; well drilling; and construction and repair of public facilities. The goodwill generated and the contribution made to the nation-building process through these efforts are highly cost-effective ways of promoting U.S. interests. Finally, our Denton Amendment space-available transportation program continues assisting generous American humanitarian donors and thousands of Third World recipients. Since this program's inception in FY 1985, DoD has transported over four-and-a-half million pounds of private sector humanitarian cargo to 26 Third World countries.

3. Burdensharing

a. Sharing Roles and Responsibilities

For over forty years our allies' societies and economies have flourished in the peaceful postwar environment which our collective security efforts have fostered. The result has been dramatic increases in both their relative military and economic potential to contribute to our common defense, and their relative stake in preserving the peace and prosperity we all enjoy. We are therefore increasing our attention to ensuring that our allies and friends fulfill collective security roles commensurate with their evolving positions. Our allies are assuming more of the responsibility for the common defense than is widely recognized, but as their relative economic power grows, we must continue urging them to do more.

We must understand that burdensharing involves much more than simple defense budget comparisons. Indeed, the term "burdensharing" fails to convey the subtlety and complexity of the real issue: each nation's willingness to assess and accept honestly the differing roles, responsibilities, risks, and resource commitments

which are its due. Such assessments must account for our allies' disparate national capacities to contribute. Some of the commonly referenced measures of relative defense effort, such as defense spending as a percentage of GNP, or proportion of population in active military service, begin to address these differing capabilities. Yet even these measures must be understood in the context of less tangible non-budgetary contributions and political considerations. For example, allied host-nation support efforts -- for instance, use of installations, maintenance, and civilian labor in peacetime, and expanded use of transportation and basing infrastructure and support force personnel in wartime -- fulfill essential roles appropriate to our allies' circumstances. Providing bases for standing allied forces (and their operations) is a major contribution, and entails considerable costs in foregone tax revenue and in political tensions. Out-of-area operations (military activities outside the alliance region) have also recently demonstrated a collective commitment. Efforts like intelligence sharing, mutually supportive foreign assistance, and armaments cooperation are further examples of burdensharing.

Perhaps as important as any one of the statistics which follow is our success in maintaining a responsible political approach to the burdensharing issue. While urging our allies to increase their efforts in various areas, we have avoided alienating our allies with public criticisms. Rather, we have achieved progress by pursuing our concerns forthrightly but quietly in diplomatic fora. We must view the burdensharing issue not as an excuse for us to do less, but as a way to encourage and lead our allies and friends collectively to do more. To lead this effort, we must maintain levels of support for our own defense and security assistance programs that set an example for others to follow. Beyond simply exhorting our allies to increase their defense budgets, we must take the lead in identifying role-sharing opportunities that maximize the efficiency of current resources, as well as specific areas where resource increases are best used to benefit the common defense. Such cooperation will provide the most effective and efficient defense posture. Perhaps more important, strong political cohesion among the United States and our friends and allies will enhance deterrence and convince adversaries that negotiation, rather than aggression, is the preferable means of international conduct.

Over the past year, Deputy Secretary Taft served as head of a special interagency burdensharing task force, making three trips to Europe and one to Asia to meet with our principal allies. The message to our allies was clear: we must find the resources, through both better management and ultimately through funding increases, to sustain the common defense and to strengthen our

alliances through a progressive evolution of the common defense burden.

b. NATO

Our NATO allies carry a substantial share of the total Alliance defense effort despite their accounting for less than half of the Alliance's economic wealth. Day-to-day non-U.S. NATO military forces number almost four million personnel, compared to over two million U.S. military personnel. Mobilization brings those personnel levels to 7 million and 3.5 million, respectively. Non-U.S. NATO countries continue to provide some 60 percent of the ground combat firepower, 50 percent of the tactical combat aircraft, and 35 percent of the naval tonnage that the Alliance would deploy in wartime. The Europeans also continue to devote extensive physical property to common defense basing and exercises. West Germany alone bases 400,000 foreign troops at over 800 installations, having a combined value of some $30 billion, and yearly hosts and supports 85 major field exercises plus thousands of smaller exercises and some 580,000 aircraft sorties.

Recent, less static indications of shared defense effort are very positive. The United States, Britain, France, Italy, the Netherlands, and Belgium all made out-of-area force deployments to defend shipping in the Persian Gulf, while West Germany provided Mediterranean deployments to free our allies' forces from that area, and Luxembourg supported the effort financially. Some allies have made significant contributions of funds or equipment to redress military deficiencies in Greece, Portugal, and Turkey, although more remains to be done. NATO's agreement to pay the facilities costs of moving the 401st Tactical Fighter Wing from Spain to Italy is another important development demonstrating political as well as financial commitment to Alliance requirements.

At the same time, the United States continues to devote more of its gross domestic product to defense than nearly all other NATO nations, and we believe that all indicators, taken together, show that many of them could increase their own efforts. Therefore, we continue to urge the Alliance to seek greater equity in sharing the risks, responsibilities and roles involved in preserving the common defense. To this end, I am greatly encouraged by our fellow Alliance members' agreement to examine in depth the existing balance of the defense burden. In December, NATO's Executive Working Group provided an excellent, comprehensive report and some initial recommendations on how best to achieve a more equitable and efficient allocation of Alliance roles and responsibilities. This is a critical first step in Alliance management of the burdensharing issue that will set the stage for follow-on efforts.

c. Other Regions

The rapid growth in economic and political power in a number of allied nations in other regions are prompting increased attention to burdensharing issues there as well. The most significant of these nations is Japan. In 1981, we began discussing our defense concerns with our allies in terms of roles and missions, instead of static indicators such as the ratio of defense spending to GNP. The Japanese responded by stating they could, within the limits of their constitution, defend their own territory and air- and sea-lanes to an offshore distance of 1,000 nautical miles. To meet this goal, Japan instituted a five-year defense plan for the 1986 to 1990 period. Furthermore, Japan has, since 1983, funded a five percent annual real growth rate in defense spending, while almost all other Japanese government functions were held to negative growth. In 1987, Japan broke a psychological barrier by authorizing defense spending in excess of one percent of its GNP. By 1990 Japan's defense budget is projected to be one of the largest in the world, comparable to those of our other major allies.

In addition to already providing rent-free bases to U.S. forces, in 1988 Japan announced an additional increase in its support for Japanese workers at U.S. bases of approximately $200 million. This will bring its share of U.S. labor costs to over 50 percent by 1990. In 1989, Japan will spend over $1 billion to cover new U.S. facilities and labor costs, amounting to a total of $2.5 billion in direct and indirect host-nation support for U.S. forces in Japan. This is the most generous financial host-nation support arrangement that we enjoy anywhere in the world.

Furthermore, in 1988 the Japanese announced they would spend at least $50 billion on economic aid over the five-year period between 1988 and 1992. This will make Japan the largest provider of overseas development assistance in the world. In sum, Japan's efforts in response to calls for greater burdensharing have been noteworthy. Still, we look for Japan to shoulder a greater share of the common defense burden, commensurate with its rapidly growing power and influence.

Other friendly nations are also assuming greater roles in providing for their security. For example, we are establishing new armaments cooperation projects with industrially capable nations, such as Israel and Egypt. The Republic of Korea, home to 47,000 American troops, has indicated its intent to continue increasing its contributions in support of U.S. forces stationed there. As various allied and friendly governments be-

come more stable and self-confident, we expect that there will be a new emphasis on greater equity in our security relationships, including sharing of security costs.

4. Security Assistance

a. Objectives

Supporting friends and allies throughout the world is a cornerstone of our national strategy. To this end, we provide our friends and allies with economic and military assistance to ensure their independent political and economic development. The Department of Defense is primarily concerned with military assistance, but security assistance in its broadest definition includes both military and economic aid.

Military assistance supports some of the most basic and enduring elements of our national strategy: collective security and forward defense. Military assistance enhances our allies' ability to deter and combat aggression without the direct involvement of U.S. forces. In addition, security assistance promotes the interoperability of U.S. and allied forces, thereby increasing their effectiveness. Security assistance also forms a vital part of the cooperative arrangements through which our forces gain access to critical military facilities throughout the world, a fundamental prerequisite for forward defense against aggression.

In today's international environment, we and our allies confront a host of challenges below the threshold of conventional war. The challenge of low-intensity conflict includes terrorism, subversion, and armed insurgency. Security assistance provides the principal policy instrument for assisting nations engaged in low-intensity conflict. A balanced package of economic and military assistance is necessary to deter or defeat security threats while overcoming the economic and social problems that breed instability.

b. The Components of Military Assistance

Our military assistance program comprises four main components:

- The Foreign Military Financing Program (FMFP) provides direct credits or grants to countries for the purchase of U.S. military goods and services, either through bilateral agreements between our governments, or through direct purchases from U.S. companies.

- The Military Assistance Program (MAP) is grant funding that assists allies and friends in financing government-to-government procurement of defense articles and services to help strengthen their self-defense capabilities. Without FMFP or MAP grant aid, many countries would have to divert scarce domestic resources from economic development to meet their defense needs.

- International Military Education and Training (IMET) is a grant aid, low-cost program that brings foreign military personnel to the United States for military education and training. Though it represents only a modest portion of our security assistance programs, IMET yields significant benefits. In addition to improving the proficiency of allied and friendly military leaders, IMET provides a channel of communications and influence with military establishments worldwide. In this way, IMET provides an avenue for the transmission of professional military values. Respect for democratic institutions and human rights is thus promoted.

- We also support the defense needs of friends and allies through cash sales of military goods and services, known as Foreign Military Sales (FMS). By assisting friendly nations to defend themselves, our FMS program helps us realize substantial political, military, and economic benefits.

c. Accomplishments of the Last Eight Years

Over the last eight years, despite our inability to achieve stable funding levels because of reduced appropriations, security assistance has registered some notable successes. In a number of conflicts throughout the world, our security assistance programs have helped to protect vital U.S. interests by helping friends deter and combat aggression. We have also made substantial gains in improving the ability of some key NATO allies, such as Turkey, Greece, and Portugal, to help carry their share of the collective defense burden. In addition, we also have improved the program itself, making it a more efficient and responsive foreign policy tool. For example:

- In El Salvador, we have helped the armed forces achieve a large measure of success against a communist-led insurgency. Although the war is not over, the democratically elected government has prevented the insurgents from gaining by force what they could not achieve through the ballot box. Our assistance has provided the democratic government with the "breathing room" necessary to undertake difficult economic and political reforms, and put that country on the path toward long-term political stability.

- In the Persian Gulf, U.S. military assistance and foreign military sales to moderate Gulf states has helped to contain the Iran-Iraq War by assisting friendly nations in resisting Iranian intimidation and aggression.

- In Chad, French and U.S. assistance has enabled the Chadian armed forces to win major victories over invading Libyan forces. Although Libya occupied almost half of Chad in 1986, its presence has been reduced to a narrow strip along Chad's northern border.

- In Israel, continued military aid has enabled the Israeli Defense Force to maintain the capability to defend itself against any likely combination of adversaries.

- In the Philippines, U.S. military aid has assisted the democratically elected Aquino government in combatting a widespread communist insurgency. In addition, our fulfillment of previous aid agreements assisted us in concluding a successful review of the Military Bases Agreement.

We have also made our security assistance programs themselves more efficient and responsive. Working with the Congress, we have enacted some much needed changes in law, and implemented management improvements to make the program a more useful instrument of U.S. foreign policy. Examples include:

- *Concessional Funding:* Over the past eight years, the President has requested -- and the Congress has revised -- security assistance to provide concessional and grant funding only. This was done in response to concerns about the debt burdens of our allies, and to stretch constrained resources to maximum advantage. Since 1981, we have provided a gradually smaller proportion of assistance in the form of repayable loans. The President's FY 1990 budget requests grant aid only.

- *Special Defense Acquisition Fund (SDAF):* In 1982, the SDAF was created to enhance our ability to meet urgent foreign needs for military equipment, while minimizing adverse effects on the readiness of U.S. forces. SDAF is a revolving fund that finances the acquisition of defense items in anticipation of authorized Foreign Military Sales. By reducing the time necessary to deliver defense equipment, we can respond more quickly when unforeseen needs arise without drawing on stocks of equipment for U.S. forces. In addition, SDAF procurements -- over $1.5 billion to date -- yield substantial benefits to U.S. defense production in the form of lower item costs through more efficient production rates.

- *Refinancing:* Beginning in FY 1988, and under congressional authority, we have offered countries with outstanding FMS loans at interest rates exceeding 10 percent the opportunity to refinance these loans to take advantage of lower interest rates currently prevailing in capital markets. In this way, we hope to reduce the debt burden which was incurred using the previous market rate of interest credit program.

d. Trends

(1) Funding Reductions

Despite the great benefits and modest cost of security assistance, it is a favorite target during budget cuts. Military assistance typically represents about one-half of one percent of the federal budget. Yet the Congress has cut consistently even this amount. The past several years, in particular, have seen this trend worsen with the President's security assistance request cut by 20 percent in FY 1986, 21 percent in FY 1987, and 18 percent in FY 1988 (see Chart 1.D.6).

Coupled with these deep cuts has been an increasing tendency on the Congress's part to earmark funds for particular countries, often above the levels requested for those countries (see Chart I.D.7). In recent years, the proportion of security assistance resources earmarked by the Congress has jumped from under 50 percent in FY 1987 to over 90 percent. For FY 1989, 93.5 percent of funding has been earmarked for just 14 countries. This combination of earmarks, coupled with reductions in overall funding levels, insulates some countries' programs while necessitating crippling cuts in our remaining programs. As a result, we have been forced in many cases to eliminate whole programs, thereby greatly reducing U.S. access and influence. This pervasive earmarking robs the security assistance program of the flexibility needed to respond to events in a fast-changing world, and threatens to undo the hard-won gains we have made.

(2) Trends in Arms Sales, 1981-1988

Another disturbing trend since 1982 is the decline in U.S. sales of military equipment (see Chart I.D.8). This decline is due in large part to political constraints that limit our ability to meet the legitimate requests of friends and allies, rather than to a decline in demand for U.S. defense goods. From 1983 to 1987, sales by the United States declined from $15.7 billion to $7 billion. Fortunately, this trend appears to have bottomed out with expected FY 1988 sales of $12 billion. Lost sales threaten the substantial benefits, both economic and political, that accrue to the United States as the supplier of choice for the defense needs of friends and allies.

U.S. Military Assistance Funding

Chart I.D.6

Legend:
- T-Rate FMS Credits
- Concessional FMS Credits
- Forgiven FMS Credits
- MAP

Y-axis: Dollars in Billions (FY 1990)
X-axis: Fiscal Year — 81, 82, 83, 84, 85, 86, 87, 88, 89, 90 (Projected)
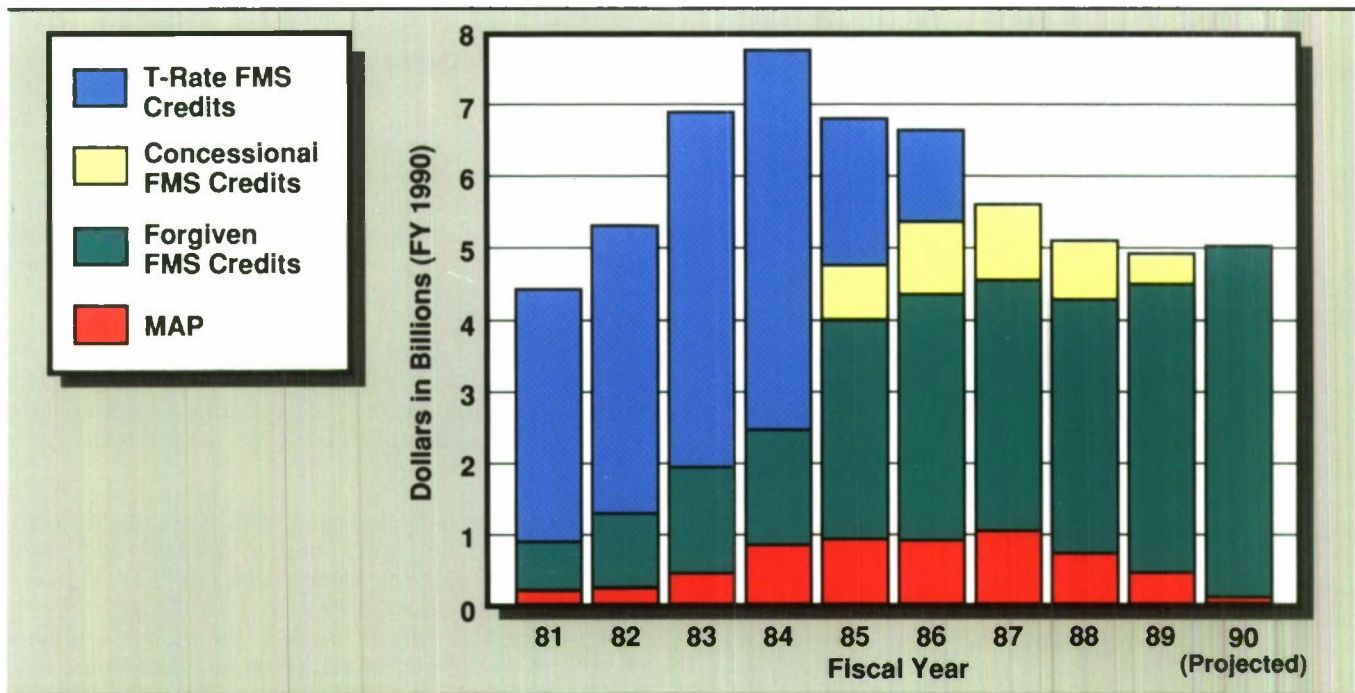
U.S. FMS Credits and MAP: Percentage Earmarked by the Congress

Chart I.D.7

Legend:
- Earmarked for Israel and Egypt
- Other Earmarked Funds
- Not Earmarked

Y-axis: Dollars in Billions (FY 1990)
X-axis: Fiscal Year — 1981 (45%*), 1982 (48%), 1983 (59%), 1984 (49%), 1985 (46%), 1986 (59%), 1987 (86%), 1988 (92%), 1989 (93%)

*Percentage of FMS Credits and MAP funds earmarked by the Congress.
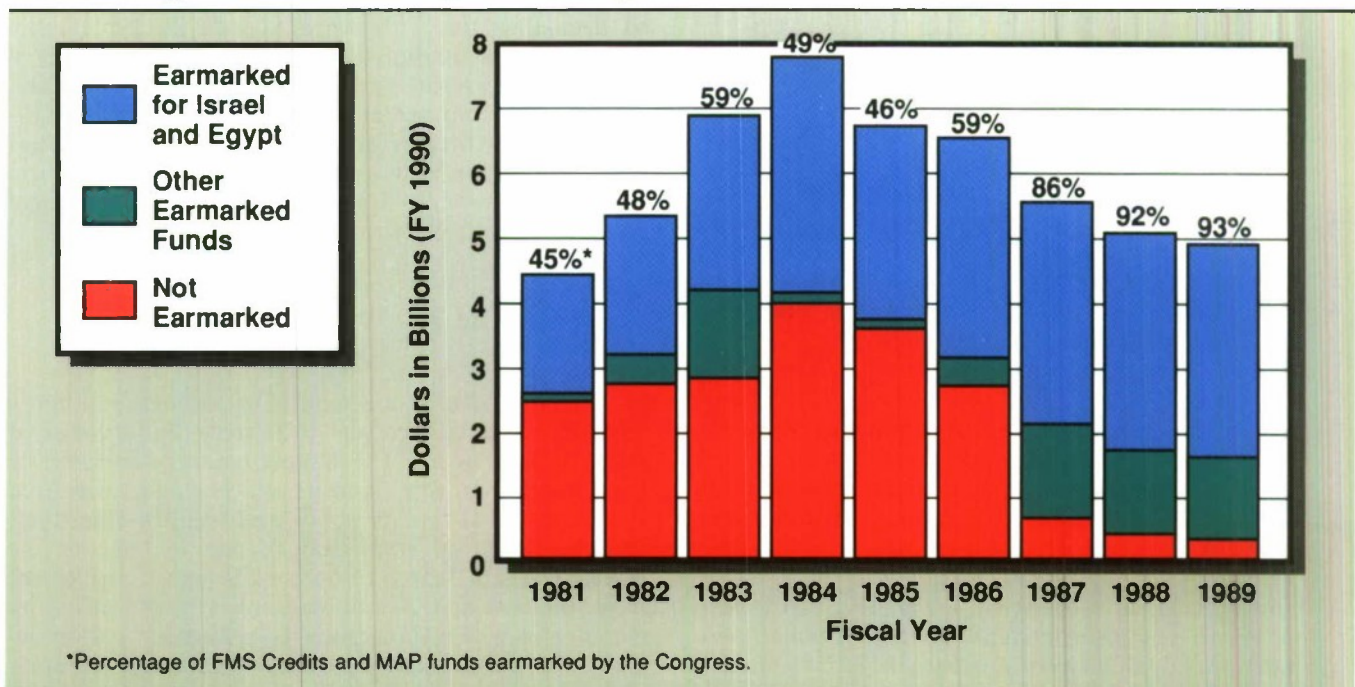
These losses in arms sales hurt us in three ways. Economically, lost sales cost us jobs, investment opportunities, and economies of scale. Politically, we risk eroding foreign governments' incentives to cooperate with us, while eroding military-to-military relations as friendly states look for more reliable security partners. Militarily, we lose opportunities for increased interoperability and defense cooperation in strategic areas. The recent decision of Saudi Arabia to turn to another supplier for the purchase of aircraft when the United States would not meet its request provides just one illustration of this phenomenon. While the initial loss is estimated to be $3 billion, the full effect of this switch by Riyadh may ultimately be ten times greater over the next decade.

(3) Impact on Objectives

Security assistance exists to facilitate the pursuit of our national security objectives. It is a low-cost investment in both our defense and foreign policies. By failing to invest, we risk incurring much higher costs in the long-term. Failure to help our allies deter and combat aggression calls into question the reliability of the United States as a security partner, while reducing our allies' effectiveness in sharing the burden of collective security. Without adequate assistance, there is great risk that we will lose regional influence around the world, and that regional conflicts could expand, necessitating direct involvement of U.S. forces.

Other risks of the continued underfunding of security assistance include:

- Decreasing our ability to assist in the pursuit of regional stability in the Middle East. America's influence in this key region will be greatly eroded if we cannot provide sufficient assistance to ensure the ability of Israel, Egypt, and other moderate Arab states to deter aggression.

- Failing to help Greece, Portugal, and Turkey meet NATO force modernization goals.

- Foregoing the opportunity to assist countries confronted by illicit and often violent drug trafficking, and narcotics-related corruption.

- Jeopardizing our access to critical military facilities throughout the world. The additional cost of trying to defend our interests without these bases would be far more costly than the security assistance we devote to ensuring their availability.

- Wasting prior investment by terminating assistance needed to complete modernization programs now under way, while existing programs receive funds insufficient even to maintain equipment on hand.

(4) A Comparison: The Soviet Security Assistance Effort

Gorbachev's increased willingness to settle Third World conflicts through negotiations has not yet had a significant impact on the flow of Soviet arms to the Third World. Indeed, Moscow continues to show an appreciation for the political leverage arms transfers confer. Soviet arms deliveries to lesser-developed countries (LDCs) rose in real terms in 1987 for the first time in five years, reaching almost $19 billion. We estimate 1988 deliveries will approximate the 1987 levels. Moscow's arms transfer program employs highly concessionary financial terms. Over 40 percent are made as outright grants. In addition, the Soviets provide low-interest loans for many arms purchases, accept some payments in soft currency or commodities, and have shown flexibility in renegotiating payment schedules.

Soviet arms deliveries go primarily to radical states, such as Libya and Syria, and to Marxist and communist nations fighting insurgencies, such as Afghanistan, Angola, and Cambodia (see Chart I.D.9). Soviet-bloc shipments of military goods to Nicaragua in 1988, for example, remained at about $500 million, despite the decline in fighting there. Moscow also announced that it would turn over a billion dollars in facilities and equipment to Afghan forces during the withdrawal of Soviet forces and reserved the right to continue arming the Kabul government.

Arms transfers also remain a key in Soviet efforts to strengthen ties with other nations. In 1988, India received large amounts of Soviet arms, including a Charlie-class nuclear-powered submarine on lease, and TU-142 Bear long-range naval reconnaissance aircraft, while North Korea received MiG-29 Fulcrum fighters and other major Soviet weapon systems. Moscow also offered to sell the MiG-29 to Jordan, which buys most of its arms from Western nations.

(5) The FY 1990 Request

For FY 1990, we are requesting the bare minimum level of resources necessary to protect the successes of the past eight years. The budget request submitted to the Congress reflects rigorous analysis and considered judgments as to foreign policy and security objectives. Coupled with our continuing efforts to improve the effectiveness of scarce resources through management improvements and careful planning with our allies, security assistance will continue to be the most cost-effective means of securing critical national security objectives.

U.S. Military Sales
(FY 1981 - 88)

Chart I.D.8
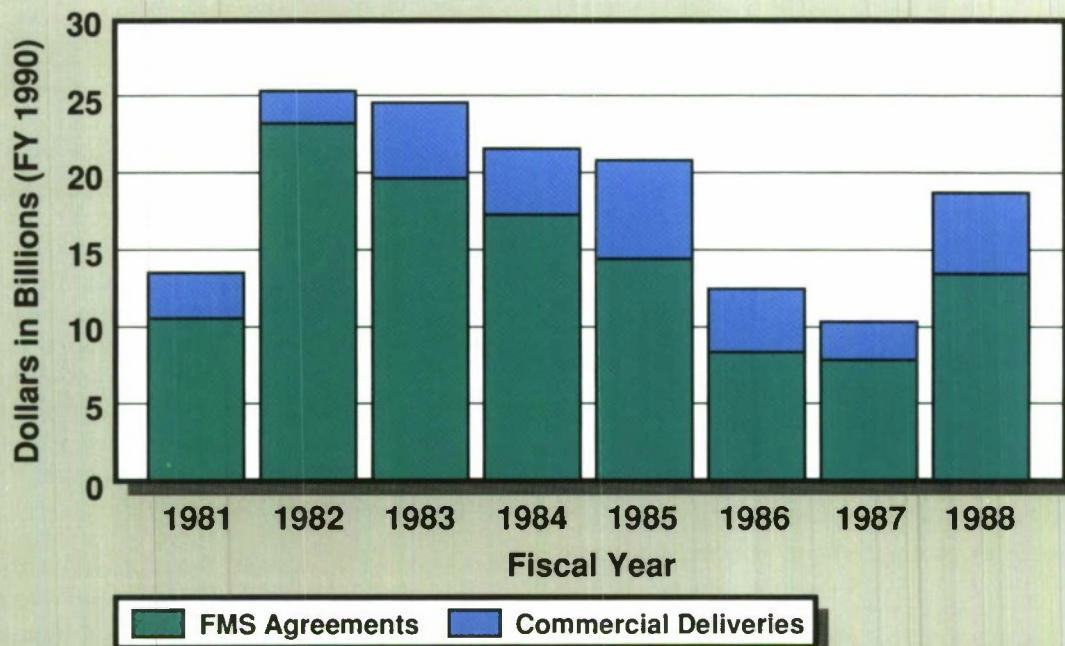
Soviet Military Sales and Assistance, and Soviet Economic Assistance *(1981-1988)* *

Chart I.D.9

Note: Includes nations receiving annual sales/assistance of $200 million or more.
* Annual average.
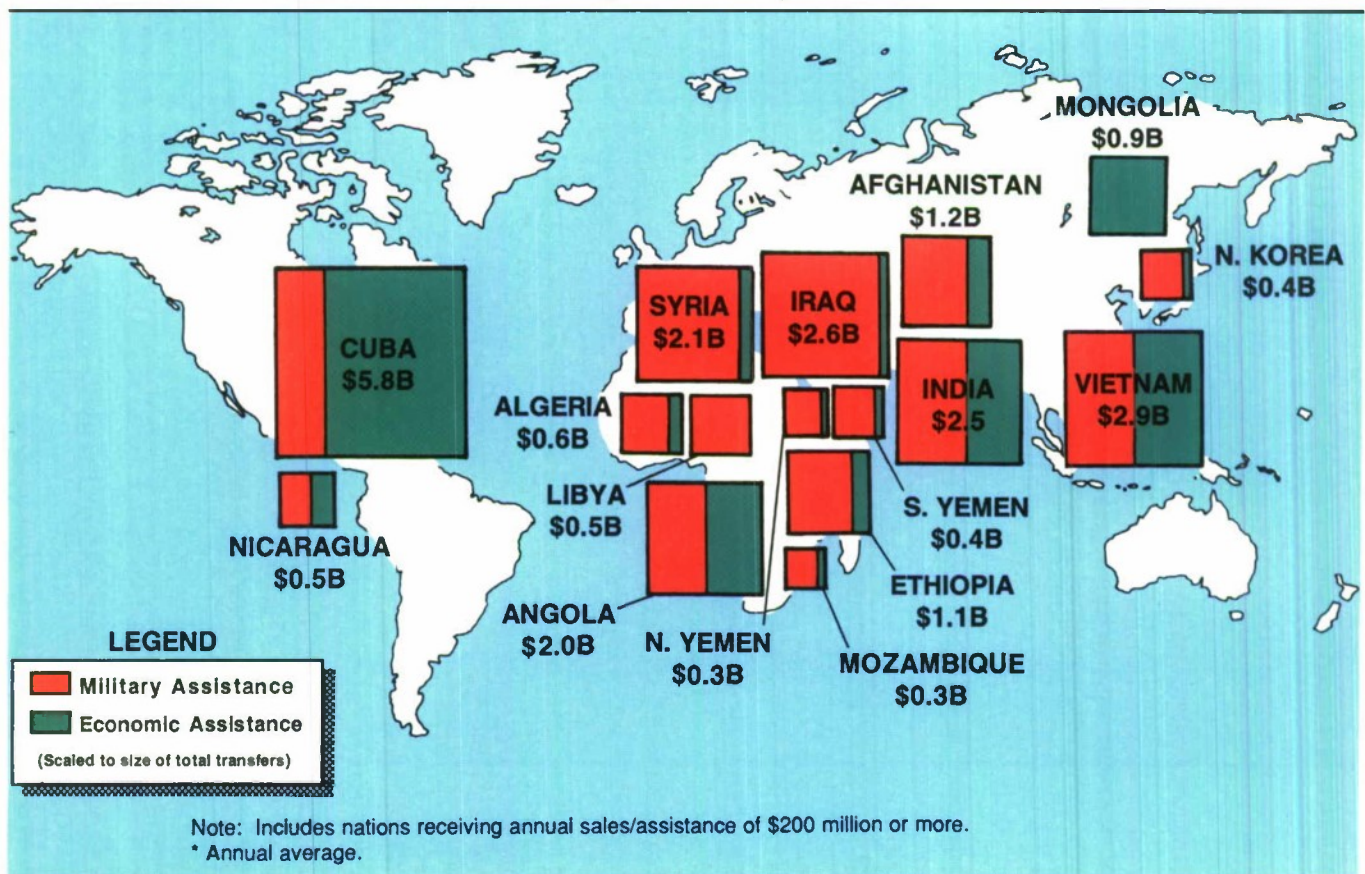
5. International Armaments Cooperation

a. Purpose and Objectives

Since our national security needs cannot readily be met with U.S. resources alone, we cooperate with allies and friends in acquiring military equipment. By reducing the number of separate national weapons programs, this cooperation reduces needless duplication of research and development efforts and prudently shares the best available technology among allies. It promotes commonality and interoperability among friendly forces, and provides incentives for our allies to invest in force modernization and burdensharing. Finally, it achieves urgently needed economies of scale throughout the acquisition and logistics cycles.

International cooperative acquisition programs seek to focus alliance resources effectively, in order to yield significant gains in our combined conventional defense posture. International programs directly engage U.S. defense industry in cooperative efforts with allied industry, sharing technology as required to achieve the goals of each acquisition program. These cooperative efforts have access to the combined strength of the alliance industrial base.

b. Resources and the Industrial Base

Driven by resource limitations and a commitment to a strong conventional defense, the United States and its allies have pursued armaments cooperation as an effective means of correcting key conventional force deficiencies. To increase the affordability of research, development, production, and logistics programs, we are steadily increasing investment in acquisition efforts where development costs and resources are shared with our allies. Consequently, we have established a goal to increase our investment in cooperative programs from the current 3 percent of RDT&E resources to 25 percent by the year 2000. Experience shows that this investment of U.S. resources has exceptional leverage, with allied contributions on average more than doubling the total U.S. resources during the development phase. This ratio continues to hold for projects already identified as potential cooperative efforts in the next five years, as shown in Chart I.D.10. Allied resource contributions, however, cannot be the sole measure of cooperative programs' effectiveness. International industrial teaming arrangements involving U.S. and allied industry provide opportunities to bolster U.S. industrial competitiveness. Given current fiscal reali-

Alliance Investment in Cooperative R&D (FY 1990 - 94 Cumulative)

Chart I.D.10
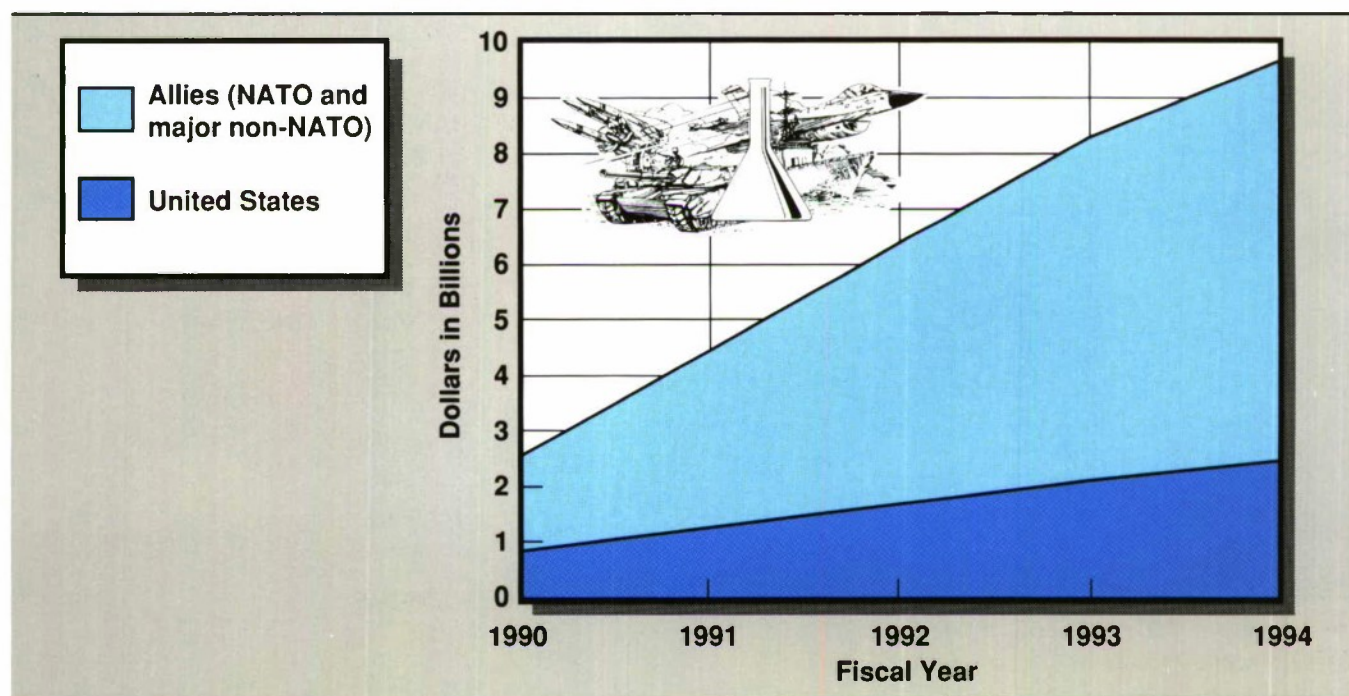
ties, it is imperative that we optimize the combined strengths of our industrial and technological base to keep it robust and fully capable. Within this context, international research, development, production and logistics programs present opportunities for a positive, active approach, with U.S. industry gaining access to new markets abroad. This can be effective at both the prime and subtier contractor levels.

c. Regional Emphasis

Since the military needs and industrial capabilities of allies vary considerably in scale and sophistication, we are organized to support regional variations in armaments cooperation. This has been recognized by congressional earmarking of a portion of cooperative research and development funds for programs with non-NATO allies. Even among the NATO members, however, wide variations in capabilities suggest some tailoring in type and structure of cooperative programs.

d. Accomplishments of the Last Eight Years

The Department, with congressional support, has made armaments cooperation an increasing part of defense systems acquisition. For example:

- We have instituted Defense Acquisition Board (DAB) procedures that make rigorous consideration of international cooperative opportunities part of all U.S. acquisition decisions.

- Congress has provided funding specifically for cooperative research, development and testing efforts with NATO and major non-NATO allies, thereby providing a significant incentive for increased armaments cooperation. Since enactment of the NATO Cooperative Research and Development Program (the Nunn Initiative) in 1985, we and our allies have greatly expanded armaments cooperation. International agreements have been reached in the 17 cooperative projects shown in Chart I.D.11, with many more in negotiation. Each of these projects involves the United States and one or more other nations sharing the costs of system development to redress a significant deficiency in our collective conventional defense posture.

- To provide in-country liaison in support of our armaments cooperation activities, 46 manpower positions have been established in Offices of Defense Cooperation (ODCs). These are located in national capitals in Europe, Japan, and Korea. They pro-

vide a visible symbol to our allies of the U.S. commitment to cooperation.

- To consolidate the progress made and ensure a coherent and effective future for armaments cooperation, we are completing the first Armaments Cooperation Master Plan. The plan outlines the DoD strategy for international cooperative research, development, production and logistics programs, and provides guidance to the Services for the coordination and initiation of future efforts.

- NATO is improving the management of armaments cooperation through a NATO Conventional Armaments Planning System (CAPS). CAPS provides the framework for developing armaments plans in response to NATO long-term force planning guidelines. NATO member nations began a two-year trial of CAPS in 1988. We strongly support this initiative and believe that CAPS will provide a much improved framework for harmonizing requirements and setting priorities that respond to the needs of the NATO Military Authorities.

e. Conclusion

We are continuing on a path to expand greatly our cooperation with the allies in research, development, production and logistics programs. It is essential that these programs be selected and our negotiating positions structured with full consideration of our defense industrial base requirements as well as the resource advantages for alliance conventional defense.

6. Technology Security

a. A Successful Program

We have made major progress in technology security during the past eight years, as the Defense Department's efforts, in coordination with the efforts of other executive departments and agencies, are paying off dramatically for the United States and for our allies. In the 1970s U.S. and allied government policy allowed the Soviet Union to acquire large amounts of advanced Western technology, and to reduce our lead in several key areas of military technology. Vigorous Western technological development, coupled with the technology security policies of the Reagan Administration, have succeeded in reversing that trend. In particular, we have denied the Soviets significant access to state-of-the-art computer technology, microelectronics manufacturing facilities, and machine tool controller technology. We have also protected a multitude of items with critical military uses, including sonars and

Nunn Amendment Projects with Signed Memoranda of Understanding

Chart I.D.11

Nunn Amendment Projects with Signed MOUs	Participants													
	United States	Canada	United Kingdom	France	Germany	Belgium	Netherlands	Denmark	Norway	Greece	Spain	Italy	Portugal	Turkey
Ada Project Support Environments	X	X	X	X	X		X	X	X			X		
155 Autonomous Precision Guided Munition	X	X		X	X		X				X	X		X
Modular Standoff Weapon	X		X		X						X	X		
Multifunctional Info Distribution System	X	X	X	X	X				X		X	X		
NATO Identification System	X		X	X	X							X		
Airborne Radar Demonstration System	X		X	X										
Adv. Short Takeoff/Vertical Landing Tech.	X		X											
Enhanced Fighter Maneuverability Aircraft	X				X									
NATO Frigate Replacement — 1990s	X	X	X	X	X		X				X	X		
Post 2000 Tactical Area Communications	X	X	X	X			X					X		
Hawk Mobility Enhancement	X						X							
NATO Anti-Air Warfare System	X	X	X		X		X				X			
Battlefield Info Collection and Exploitation	X		X											
Agile Falcon/F-16 Upgrade	X					X	X	X	X					
LINK-11 Improvements	X	X	X	X	X		X				X	X		
Surface Ship Torpedo Defense	X		X											
RPV Multimission Optronic Stabilized Payload	X (Israel)													

photo reconnaissance equipment. As a result, our lead times in numerous critical technology areas have increased again. The United States now leads the Soviet Union by anywhere from seven to twelve years in computer-operated machine tools, minicomputers, mainframes, supercomputers, software, and flexible manufacturing systems. These advances have been bolstered by improvements in the defense capabilities of our allies in Europe and Asia. All this has strengthened our collective military security.

b. Key Accomplishments of the Past Eight Years

In 1985 DoD formed the Defense Technology Security Administration (DTSA), merging previously dispersed staff elements and providing a focal point for administering the DoD Technology Security Program. DTSA has ensured coherent and efficient implementation of Defense Department technology security policy concerning the international transfer of defense-related technology, goods, services, and munitions.

Due in large part to substantial enhancement of DTSA's automation capabilities, we have speeded up our review of export license applications -- a process that typically averaged 90 days in 1981, but only 10 days in 1987 -- while greatly improving the level of technical and policy analysis in these reviews. This dramatic improvement, occurring when the number of applications reviewed by DoD rose from less than 10,000 per year to approximately 30,000, has helped U.S. industry respond more rapidly to export opportunities.

Finally, during the past eight years we assisted in countering intense Soviet efforts to gain Western technology through international fora and organizations. The Defense Department has also vigilantly monitored the efforts of the Soviet Union and its surrogates to acquire Western technology in the context of bilateral science and technology agreements with the United States.

c. Today's Changing Environment and Tomorrow's Challenges

(1) Strengthening COCOM

The Reagan Administration has made the strengthening of COCOM a key element of its technology security policy. COCOM is the Coordinating Committee for Multilateral Export Controls, established in Paris in 1950 to coordinate Western efforts to control the export of technology critical to our national security and that of our allies. It now includes all members of NATO, except Iceland, plus Japan. The United States has worked with our fellow COCOM members to update the control lists to include technologies that now are critical to advanced military systems.

COCOM also has been taking account of the spread of high technology beyond the United States, Japan, and Western Europe. COCOM initiated "Third Country Cooperation," directed toward non-COCOM industrializing nations that are part of the worldwide technological revolution being generated by COCOM member nations. COCOM's Third Country Cooperation builds on strategic trade arrangements between members and non-members that permit legitimate trade in sensitive and advanced products, while minimizing the risk of theft or diversion. Ten neutral European and Asian nations have established or improved their export control programs.

Western nations have become acutely aware that sales like those made by Toshiba-Kongsberg have serious implications for our collective security. They indicate that the Soviet Union has the capability, and the intention, to obtain high technology illegally, even from well-known corporations. In the wake of these illegal sales, the United States and our allies, particularly Norway and Japan, moved to strengthen Western technology security. We encouraged all COCOM members to recognize that they have wide differences in their enforcement of controls and in prosecution of violations.

For example, the United States assigns several hundred officials to review license applications and to enforce export control regulations; the U.S. Export Administration Act of 1985 punishes violations of these regulations with prison terms of up to ten years. Furthermore, the Department of Defense, which has the greatest stake in the success of national security export controls, plays a vigorous role in U.S. government policymaking. By contrast, some COCOM governments have assigned relatively few officials to export licensing. Others have treated illegal exports of strategic technology lightly, and have no criminal penalties for violators. Some governments have even denied their defense ministries a meaningful role in export control decisions.

One key result of our effort was a Senior Political Meeting of COCOM held in France in January 1988. This meeting recognized the importance of effective enforcement. All members agreed to harmonize and reinforce the effectiveness of national enforcement systems and export controls to stop illegal diversions and to strengthen cooperation with non-COCOM countries to protect Western high technology. These measures are having positive results, and are enhancing overall cooperation in the area of technology security.

(2) Negotiations and Contacts with the Soviets

Despite the progress noted above, some people contend that improvements in East-West relations are making technology security superfluous, even harmful. Chairman Gorbachev and other Soviet leaders seek Western technology as part of their drive for a "restructuring" (perestroika) of the stagnant Soviet economy. They have intensified their attacks on COCOM and on export controls. Some Western business circles are pressing for decontrol and licensing reductions, and some European political leaders support this theme, arguing that strategic trade controls are not compatible with an increase in East-West trade. They see the modernization of the Soviet economy as leading to a more peaceful world.

There is no compelling evidence, however, that modernization of the Soviet economy would lessen significantly the political power of the Soviet military or the level of Soviet military spending. Under Gorbachev, defense continues to enjoy the preferred treatment in funding established by Brezhnev. In 1987, for example, the Soviet Union spent 15 to 17 percent of its gross national product on the military, compared to 6.2 percent in the United States.

Furthermore, the Soviet military seems to have good reason to support Gorbachev and perestroika, at least for the present. Military leaders believe that the Soviet economy must undergo major reforms to create the broad scientific and technical base needed to develop the most modern military technologies. In this regard, the Soviet General Staff shares many of the

same long-term interests as Gorbachev's economic re-formers. The Soviet military needs advanced Western technologies as much as Soviet civilian economic re-formers. For example, in the late 1970s and early 1980s, military journals noted that the Soviet Union's failure to invest sufficiently in machine-building was hurting the defense sector. Gorbachev subsequently made machine-building one of the highest priorities in the current, 12th Five-Year Plan (1986-1990).

The Soviet government intends to acquire, legally or illegally, those technologies that they believe are nec-essary to support their military programs. Indeed, the Soviets consider certain technologies, including sen-sors, computers, microelectronics, telecommunications and munitions, as central to rapid future improvements in conventional force capabilities. Moscow also has mounted efforts to acquire automated production and control systems, such as computer-assisted design and computer-assisted manufacturing. Those systems are critical to Soviet machine tool industry modernization.

Thus the United States and our allies must continue to guard our technology even as we negotiate arms reductions and work toward a lessening of political ten-sion with the Soviet Union. We must remain alert for Soviet attempts to exploit changes in the political cli-mate. For example, Soviet economic ministries are pressing for "joint ventures" with American, Euro-pean, and Japanese firms, including many that produce sensitive technologies. While many joint ventures are desirable in terms of revenues generated for U.S. firms, we must continue our efforts to ensure that the Soviet Union does not gain access to controlled technologies through such ventures. Our efforts to strengthen CO-COM provide the groundwork for such actions.

d. Conclusion

The Reagan Administration set a solid course in technology security. If we maintain this course our na-tion will be measurably stronger and safer. Moreover, the Defense Technology Security Program has proven itself highly cost-effective. It saves money for the tax-payer because it lowers the cost of deterring the threats to our security. It saves money for American exporters by reducing the time needed to process license applica-tions. If the United States and its allies can preserve our strategic technological edge, we gain great leverage in our national security policies.

E. REDUCING AND CONTROLLING ARMS

1. Introduction

Our arms control objectives are fully integrated with U.S. national security policies designed to enhance deterrence, reduce the risk of war, support alliance relationships, and ensure the Soviets do not gain a militarily significant advantage in one or more areas of the U.S.-Soviet military balance. Arms control is not an end in itself, but only one of several tools to enhance our national security. In all, our negotiating policy of firmly holding to principled positions, like effective verification and equal rights and limits, while continuing U.S. force modernization to ensure deterrence and enhance stability, has proven highly successful in achieving our objectives.

Over the past eight years, the United States has shown that arms reduction agreements can be reached with the Soviet Union, but that we will not tolerate continued Soviet violations of existing arms control agreements. On May 27, 1986, President Reagan declared that "the United States would henceforth base decisions regarding its strategic force structure on the nature and magnitude of the threat posed by Soviet strategic forces and not on standards contained in the SALT structure which has been undermined by Soviet noncompliance . . . ." The United States believes that arms control agreements must be mutually adhered to. We should not undermine our security through unilateral adherence to an arms control agreement if the Soviet Union does not practice compliance.

The United States is presently negotiating agreements with the Soviet Union on deep reductions in strategic offensive nuclear forces, and on strategic defense and space-based systems. The Strategic Arms Reduction Talks (START) have made significant progress to date, including preparation of a joint draft treaty text, reflecting areas of agreement and disagreement between the parties, together with several draft protocols. In the Defense and Space Talks, draft documents also have been developed and exchanged. Although the latter negotiations are not as far along as is START, an important dialogue has been established and progress is being made.

Significant progress also has been made in other areas. For example, we are moving toward achieving effective verification procedures for the Threshold Test Ban Treaty and the Peaceful Nuclear Explosions Treaty. In 1986, at the conclusion of the Stockholm Conference on Confidence- and Security-Building Measures (CSBMs) and Disarmament in Europe (CDE), the 35 participating states adopted a set of concrete measures to increase the openness and predictability of military activities in Europe. In 1987 NATO and Warsaw Pact states began discussions to resume the work begun in Stockholm on CSBMs, as well as to develop a mandate to establish the objectives, scope, and procedures for new negotiations on conventional stability in Europe. To complement our ongoing efforts to reach a comprehensive, global and effectively verifiable ban on chemical weapons (CW), we proposed a conference on chemical weapons use, which was recently held in Paris. Finally, the United States and the Soviet Union have implemented two new agreements designed to build confidence between us. The first agreement established Nuclear Risk Reduction Centers, one in each capital, to facilitate rapid communication of notifications required by existing arms control agreements between the two countries. The second agreement provides for notifications prior to U.S. and Soviet strategic ballistic missile launches. In summary, we have made steady progress toward agreements that will enhance our national security and that of our allies.

2. The Intermediate-Range Nuclear Forces Treaty

The INF Treaty was signed at the Washington Summit on 8 December 1987 and entered into force on 1 June 1988. This historic treaty will completely eliminate an entire class of nuclear weapon delivery systems -- in this case all ground-launched U.S. and U.S.S.R. ballistic and cruise missiles with ranges between 500 and 5,500 kilometers. The "zero option" was considered impossible to achieve when first proposed by President Reagan in 1981, yet it will become a reality in less than three years. Our success in the INF negotiations was made possible by allied determination to adhere to NATO's 1979 decision to deploy U.S. longer-range INF missiles barring an agreement with the Soviets on INF missile reductions. Through its steadfastness, NATO demonstrated convincingly to the Soviets that it has the political will necessary to ensure its security.

A key element of the treaty is its provisions for on-site inspection. These provisions will enhance our ability to verify treaty compliance. The On-Site Inspection Agency (OSIA) was established in January 1988. It provided an operational infrastructure for conducting inspections of Soviet facilities and escorting Soviet inspectors at U.S. facilities within six months of its creation. After the INF Treaty entered into force, the United States and the Soviet Union conducted a series of baseline inspections to verify the data exchanged between both sides, and to document the locations and numbers of treaty-limited items declared under the treaty. Teams of U.S. inspectors examined 130 facili-

ties at 115 locations in the Soviet Union and Eastern Europe. The Soviets inspected 31 sites in the United States and Western Europe. Three years after the treaty's entry into force all treaty-limited items are to be eliminated. The treaty also permits a quota of inspections for up to thirteen years to monitor compliance with the treaty's provisions. Another unique inspection precedent was set in establishing continuous portal monitoring at a missile final assembly or former production facility in each country. This will help to ensure that production of missiles prohibited by the treaty has ceased. The inspections are proceeding smoothly, and the inspection and elimination timetables of both countries are on schedule.

The Special Verification Commission (SVC) was established by the INF Treaty to resolve questions of compliance, and to agree upon measures to improve the treaty's effectiveness. The SVC meets by agreement of the United States and the Soviet Union. To date, three rounds of the SVC have been completed.

3. Strategic Arms Reduction Talks

In START our goals are deep, equitable, stabilizing and effectively verifiable reductions in the number and destructive power of U.S. and Soviet strategic offensive nuclear arms. We have continued to press the Soviet Union, through firmness at the negotiating table and through our strategic modernization program, to accept a treaty that will achieve these goals.

The parties now agree on a 6,000 warhead ceiling, a limit of 4,900 warheads on ballistic missiles, a limit of 1,600 deployed strategic offensive delivery systems, a reduction of approximately 50 percent in Soviet ballistic missile throw-weight, and a 50 percent reduction in the Soviet heavy ICBM force and the warheads it carries (see Chart I.E.1). In the past year, we have continued to expand the areas of agreement in START. We also have had extensive discussions on ballistic missile and air-launched cruise missile (ALCM) accountability, and have explored the possibility of effectively verifying limits on mobile ICBMs. We also have insisted that verification procedures be negotiated in parallel with discussions on reductions. This has resulted in Soviet agreement, in principle, on verification procedures that go far beyond the national technical means relied upon in the SALT agreements. We have made significant progress in translating the general agreements on verification into specific procedures.

The INF Treaty shows the wisdom of pressing for a ban on a weapon system while proceeding with its development and deployment, both as an incentive for the Soviets to negotiate in good faith, and to deter the increased Soviet threat if an agreement cannot be reached. Similarly, the United States believes that a

Growth in Soviet Strategic Offensive Warheads

Chart I.E.1

a Neither SALT I nor SALT II placed limits on ballistic missile warheads. Data reflect Soviet ballistic missile warheads on these dates.

b As of 30 November 1988.

c The United States and Soviet Union have agreed to a sublimit ceiling of 4,900 on the aggregate number of ICBM plus SLBM warheads. The United States has proposed a 3,000-3,300 limit on ICBM warheads under the 4,900 limit.

ban on mobile ICBMs is a necessary provision in a START agreement. If, however, the sides can agree on a regime of effective verification of limitations on the deployment of mobile ICBMs, the United States would be willing to reconsider its position. At the same time, the President has indicated that we will develop a mobile ICBM. These decisions are not contradictory, but complementary. They are intended to enhance our national security by supporting our negotiating position, while maintaining the ability to deploy mobile ICBMs should the Soviets decline to enter into an effectively verifiable agreement.

A major obstacle to progress in START remains the Soviet Union's continuing attempt to hold any agreement hostage to our agreeing to limitations on SDI that would effectively cripple or eliminate that program. While we have actively pursued a dialogue with the Soviet Union on the relationship between offense and defense, the United States has rejected Soviet efforts to compromise our Strategic Defense Initiative as part of an agreement on strategic offensive nuclear forces.

Thus despite the significant progress achieved in the START negotiations, much remains to be accomplished before the treaty will be completed. For example, the issue of heavy ICBMs remains unresolved. The Soviet Union has stated that it would agree to a limit of 154 heavy ICBMs. We also seek, however, to ban the the production, flight testing or modernization of new or existing types of this most destabilizing type of ICBM. Furthermore, the United States seeks a sublimit of 3,000-3,300 on the number of ICBM warheads to help ensure that a START agreement will enhance strategic stability. Significant disagreement remains on several issues, including how to define and count air-launched cruise missiles (ALCMs) and how to treat sea-launched cruise missiles (SLCMs). We have, however, laid the groundwork for future progress.

4. The Defense and Space Talks

In their Joint Statement after the Washington Summit, President Reagan and Chairman Gorbachev instructed their negotiators in Geneva to work toward a Defense and Space agreement that would commit the sides to:

- Observe the ABM Treaty as signed in 1972, while conducting research, development and testing as required, which are permitted by the treaty, and not to withdraw from the treaty for a specified period of time.

- Begin intensive discussions on strategic stability not later than three years before the end of the specified period, after which, in the event the sides have not

agreed otherwise, each side will be free to decide its own course of action.

- Discuss ways to ensure predictability in the development of the U.S.-Soviet strategic relationship, under conditions of strategic stability, in order to reduce the risk of nuclear war.

- Record the agreement in a mutually satisfactory manner. Such an agreement must have the same legal status as the Treaty on Strategic Offensive Arms, the ABM Treaty, and other similar, legally binding agreements.

In January 1988, the United States tabled a draft Defense and Space Treaty designed to build on those elements of the agreement reached in Washington. The draft treaty would help provide a stable, predictable basis for developing and testing advanced defenses against strategic ballistic missiles, and for deployment of such defenses if they prove feasible. Our draft treaty would help both sides move toward a safer and more stable world -- one with reduced levels of nuclear arms and an enhanced ability to deter war based on the increasing contribution of effective strategic defenses against ballistic missile attack.

At present, the United States has four areas of substantive disagreement with the Soviets in the Defense and Space Talks. First, we believe that a strategic arms reduction agreement should stand on its own merits, and not be linked to unacceptable limits on SDI research, development, and testing. The Soviets, however, want an agreement that would permit them to suspend START reductions if the United States were to move toward deploying strategic defenses.

Second, we disagree with the Soviets about activities permitted during the ABM Treaty nonwithdrawal period. Throughout the negotiations, we have consistently sought to preserve our full research, development, and testing rights under the treaty. The phrase "research, development and testing as required, which are permitted by the ABM Treaty" contained in the Washington Summit Joint Statement is consistent with the long-standing U.S. position regarding the proper interpretation of the ABM Treaty. Based on subsequent official statements in Washington, Geneva and Moscow, the Soviets demonstrated that they clearly understand how the United States interprets the language agreed to at the Summit.

Third, the Washington Summit Joint Statement instructs the negotiators to work toward an agreement that would commit the sides not to withdraw from the ABM Treaty for a specified period of time. The Soviets favor a blanket nonwithdrawal commitment. The United States insists that it must retain certain internation-

ally recognized withdrawal rights in the event that a side's supreme interests are jeopardized, as well as termination and suspension rights in the event the treaty is materially breached by the Soviets.

Fourth, the sides have not resolved the issue of what occurs at the end of the nonwithdrawal period. At the Washington Summit, the President and Chairman agreed that each side had the right to choose its own course of action, including the right to deploy strategic defenses after the nonwithdrawal period. The context of their summit discussion makes clear this right refers to the deployment of defenses after the nonwithdrawal period. The Soviets, however, have subsequently taken the position that at the end of the nonwithdrawal period the parties' withdrawal rights under the ABM Treaty would be reestablished.

5. Confidence-Building Measures

The Administration made progress toward its goal of expanding confidence-building measures (CBMs) involving the Soviet Union when the Agreement on Notification of Launches of Intercontinental Ballistic Missiles and Submarine-Launched Ballistic Missiles was signed at the Moscow Summit. This agreement provides, for the first time, an obligation for each side to notify the other of upcoming ICBM and SLBM launches. Previously, each side had been notifying the other only of ICBM launches that impacted in international waters. Because of the differences in our testing practices, many Soviet launches were not required to be announced. Henceforth, all -- not only a subset of -- ICBM and SLBM launches must be announced at least one day in advance. Moreover, data on launch areas and impact areas will be exchanged in all cases. I am pleased that this agreement, first proposed by the Defense Department, will strengthen mutual confidence and understanding.

I would like, as well, to note with satisfaction the smooth functioning of the Nuclear Risk Reduction Centers. These centers, which became operational in April 1988, were based on an agreement signed in September 1987. These centers are now transmitting all ballistic missile launch notifications, and notifications relating to the INF Treaty. The upgrade of the Washington/Moscow Direct Communications Link (DCL) for high-speed facsimile operations was completed in December 1987. It will provide for a more reliable and accurate exchange of emergency message notification between the Heads of State of both nations.

6. Treaty Compliance: The ABM Treaty Review Conference

As noted, the United States is deeply concerned over the Soviet Union's failure to comply with its arms control obligations. These concerns were recently voiced at the ABM Treaty Review Conference in Geneva this past August. At the conference, both the United States and the Soviet Union discussed their concerns relating to the treaty in frank terms. Throughout the review, we emphasized the Soviets' treaty violations, especially the large, phased-array radar deployed near Krasnoyarsk in south-central Siberia. Such radars take years to build and are essential components of a nationwide defense, which is prohibited by the treaty. We made it clear to the Soviets that the radar's deployment constitutes a significant violation of a central element of the ABM Treaty, that it will continue to raise the issue of material breach of the Treaty, and that the radar should be dismantled immediately. We have made it clear to the Soviets that we will not be able to conclude any further strategic arms control agreements until the violation is corrected in a verifiable manner that meets our criteria. In the interim, we have reserved the right to take appropriate and proportionate responses. We also have discussed the Soviet violation of the ABM Treaty involving the radars illegally deployed at Gomel. At the second 1988 session of the Standing Consultative Commission, the Soviet Union obligated itself to actions which, when verifiably completed, would remove our concerns regarding the radars. We also have discussed other ABM-related compliance concerns with the Soviets that, taken together, suggest that the Soviet Union may be preparing a prohibited ABM territorial defense. In summary, the Soviet leadership must understand the importance of full compliance with its obligations on all arms control treaties as a precondition for future progress in reducing armaments.

7. Nuclear Testing Limitations

As long as we must rely on nuclear weapons for deterrence, nuclear testing will be required to ensure that our nuclear weapons remain safe, reliable, effective and survivable. The United States conducts its testing program in full compliance with existing international agreements, and we test neither more often nor at yields higher than absolutely necessary for our security requirements.

In sum, we do not regard nuclear testing as an evil to be curtailed, but as a tool which the United States employs responsibly in the interests of our national security. Indeed, as a consequence of our testing program, we have introduced newer, safer, and more effective systems while dramatically reducing the num-

ber of weapons in our stockpile -- along with their total explosive power -- from the levels of 20 years ago (see Chart I.E.2).

This is why we strenuously oppose congressional efforts to limit further our nuclear weapons testing. A Congress that demands rigorous testing of conventional weapon systems to ensure their safety and effectiveness must surely appreciate the dangers of additional restrictions on testing complex nuclear systems that we rely on for deterrence.

Still, while maintaining our vital testing program, this Administration has put forward a practical agenda for nuclear testing limitations. The Soviet Union has accepted our long-standing position that the necessary first step is an agreement on new protocols that would provide for effective verification of the unratified 1974 Threshold Test Ban Treaty (TTBT), and the 1976 Peaceful Nuclear Explosions Treaty (PNET). Negotiations on those protocols have progressed well over the past year. Furthermore, a joint verification experiment (JVE) permitted each side to use its own method of yield measurement during a nuclear explosion at the other's test site. The JVE clearly demonstrated the effectiveness, practicality, and non-intrusive nature of our CORRTEX (Continuous Reflectometry for Radius versus Time Experiments) measurement system. Furthermore, the JVE has provided the Soviet Union all

the information necessary to accept the routine American use of CORRTEX for verification of the 1974 and 1976 treaties, and to finalize the new TTBT protocol.

Once our verification concerns have been satisfied and the treaties ratified, the United States will propose that we and the Soviet Union immediately enter into negotiations on ways to implement a step-by-step parallel program -- in association with a program to reduce and ultimately eliminate all nuclear arms -- of limiting and ultimately ending nuclear testing.

The initial goal of the negotiations following TTBT and PNET ratification would be to explore with the Soviets to what extent other arms control or arms reduction agreements had established a basis for a parallel specific, effectively verifiable limitation on nuclear testing. As a matter of policy, the United States has made no decisions regarding any specific limitations which might be considered following TTBT and PNET ratification. Such decisions cannot be made prudently without an analysis of the specific details of arms reductions agreements in other areas. If progress in other areas of arms control increases overall U.S. and allied security and enhances stability, it may be possible to identify, negotiate, and accept some form of further limitations on nuclear testing. Agreement on any such increased limitations on nuclear testing could only be acceptable in parallel with the conclusion of legally

U.S. - Soviet Nuclear Force Megatonnage Levels
(FY 1960 - 89)

Chart I.E.2
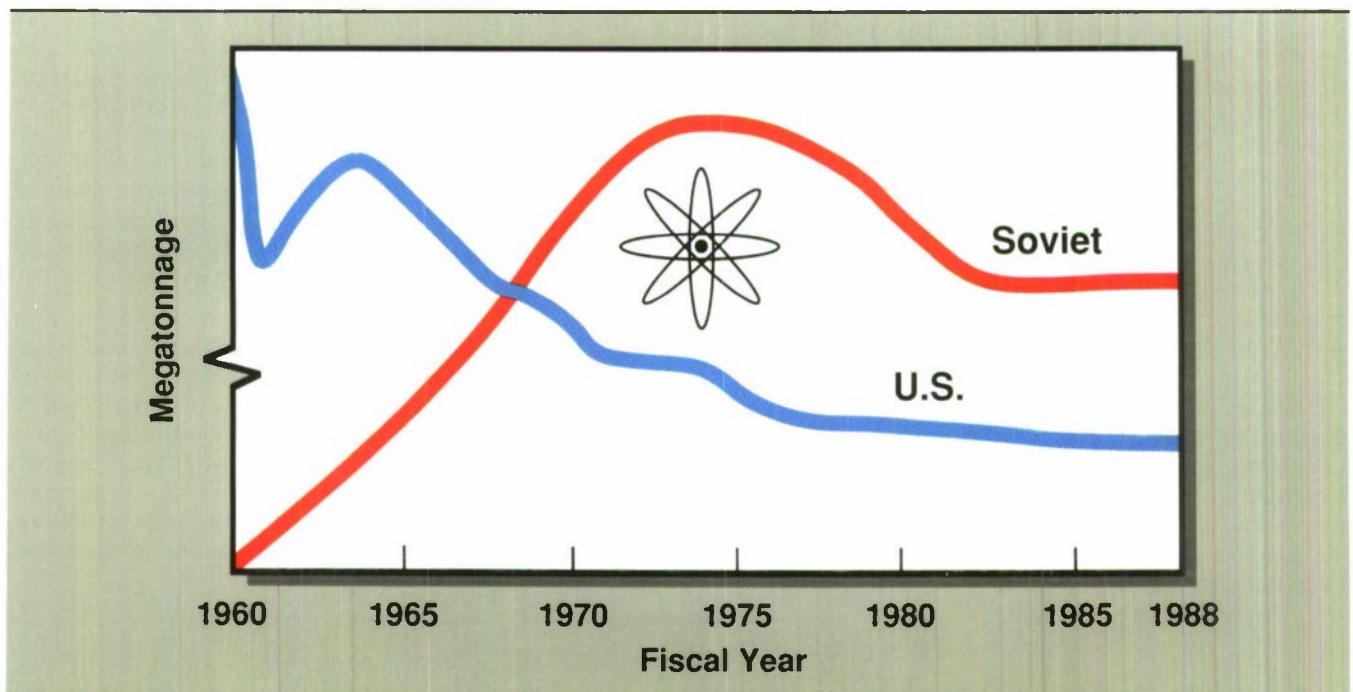
binding treaties that enhance stability. Unspecified "progress" toward agreement is not sufficient.

A comprehensive test ban (CTB) remains a long-term objective of the United States. Such a ban, however, can be realized only when we do not need to depend on nuclear deterrence to ensure international security and stability, and only after we have achieved broad, deep, and effectively verifiable arms reductions, substantially improved verification capabilities, expanded confidence-building measures, and greater balance in conventional forces.

8. Conventional Arms Control

Separate from nuclear arms control, but equally significant, are conventional arms control negotiations. These negotiations assume added importance in light of the INF Treaty and progress in the START negotiations. In Vienna, NATO and Warsaw Pact representatives are concluding a mandate to guide the new Conventional Stability Talks (CST), which should begin shortly. These talks will seek to establish a more secure and stable balance of conventional forces at lower levels in Europe. However, these negotiations, even if successful, cannot substitute for a continued commitment by the United States and its allies to maintain a strong defense. Thus, it is imperative that NATO approach any conventional arms control negotiations with the Warsaw Pact in a unified manner.

9. Chemical Arms Negotiations

We remain committed to negotiating a comprehensive, effectively verifiable, and truly global ban on chemical weapons (CW) at the 40-nation Conference on Disarmament (CD) in Geneva, and have made considerable progress in this area. Nevertheless, many difficult issues remain, most of them involving the extremely difficult problem of establishing an effective verification regime. This problem has been compounded as new CW technologies emerge that might ease the task of nations wishing to circumvent a ban. Moreover, we must find a way to ensure that all states capable of producing chemical weapons sign and adhere to the provisions in any convention that may be developed.

We are also engaged in bilateral chemical weapons discussions with the Soviet Union to help facilitate negotiations in the CD toward a ban. These discussions began as a result of the 1985 Geneva Summit, and have now met for ten rounds. These talks are focusing on verification, confidence-building measures, and other requirements of a comprehensive ban. Finally, the

United States is deeply concerned about the dangerous proliferation of chemical weapons capabilities and the resulting increased risk of chemical weapon use. The use of chemical weapons in the recent Iran-Iraq War is but the latest tragic example of the horrors of these weapons. Indeed, the repeated illegal use of chemical weapons in violation of the 1925 Geneva Protocol has eroded the force of that instrument. The United States is engaged in a number of activities aimed at reinforcing the international efforts to control the dangerous spread and illegal use of chemical weapons. As noted above, France has hosted an international conference earlier this year at which participating nations discussed reinforcing the existing norms against the illegal use of these weapons.

10. Conclusion

We have negotiated significant arms control agreements in the past eight years, and made considerable progress in many other areas of arms control as well. We have achieved this by being serious about force modernization; developing and tabling sound arms control positions in close coordination with our allies; being firm in holding to these positions in negotiating with the Soviet Union; and not tolerating Soviet noncompliance with its treaty obligations.

It is easy to achieve agreements; it is difficult to obtain good agreements. We could, for example, have had an INF agreement earlier than December 1987, but it would have left in existence nuclear forces to threaten Asia and possibly Western Europe, rather than totally eliminating an entire class of nuclear weapon delivery systems. We could also have negotiated a strategic arms treaty that, like the SALT I Interim Agreement and the SALT II Treaty, would have allowed the further buildup of Soviet strategic nuclear forces. We instead made the reduction of strategic nuclear arms our goal. While this has not been completely achieved, we have made significant progress along the path toward reducing strategic systems by 50 percent, although significant issues have yet to be resolved.

Similarly, our efforts in the Defense and Space Talks, conventional and chemical arms control, and confidence-building measures will yield worthwhile results only insofar as we adhere to the proven policies that have brought us this far. We cannot create a world without risk, but the combination of military modernization and arms control negotiations now under way offers hope that the future will be one of enhanced security for all peoples.

Part II
Defense Resources

A. THE DEFENSE BUDGET

1. Introduction

In 1981, President Reagan initiated a successful program to restore the readiness and sustainability of our military forces, and to modernize our forces to meet the future challenges to our security. This program, which resulted from a shared commitment by the Administration and the Congress between 1981 and 1985, helped to restore national pride and international respect for the United States, contributed to strengthening our alliance partnerships, and gave the Soviets incentives to negotiate seriously with us. This progress, however, has been threatened by four years of real decreases in congressionally approved defense funding. If this trend continues, we will again have a force structure insufficient to meet the requirements of our military strategy and be faced with a costly rebuilding effort.

In order to protect the gains we have made and to provide the resources necessary to meet current and future national security requirements, we must re-establish a shared commitment to stable and predictable defense funding. The 1987 Budget Summit agreement between the Congress and the President was the first step in this effort. It ended last year's budget gridlock and set defense funding for FY 1988 and FY 1989, which the Congress supported throughout the budget deliberations. Even though many problems in the budget process remain, this spirit of cooperation demonstrated by the Congress could lead to budget reform and preclude future budget impasses.

The FY 1990-91 biennial defense budget represents the critical next step. This budget, if fully supported by the Congress, sets the stage for long-term changes that will allow us to maintain a balance between existing defense programs and the modernization and development efforts so critical to our deterrent strategy. There are clearly increased risks to our security due to severe funding constraints. Fortunately, the strength and flexibility of the process by which the Department translates policy and strategy into programs and budgets enabled us to make adjustments to minimize the impact of these risks. The OSD staff, the military departments, the Joint Chiefs of Staff, and the commanders in chief of the unified commands cooperated fully to ensure that our restructured defense program will have the deterrence and warfighting capabilities necessary to enable us to preserve the peace.

2. Resources for a Strong Defense

a. Preserving Our Defense Capabilities

In meeting our defense commitment we have improved nearly every aspect of our military capability. Yet over the last four years the Congress has cut deeply into defense requests (see Chart 11.A.1). As a result, defense funding decreased more than 11 percent in real terms during this period, and many of the problems that threatened our readiness and modernization during the 1970s re-emerged.

The adjustments we made last year to the FY 1989 budget to meet the budget summit funding targets laid the groundwork for turning this situation around. We were determined to preclude a hollow, unprepared military force and inefficient acquisition practices. Therefore, we reduced personnel levels and force structure in order to retain a balanced, well-equipped force and terminated a number of weapons programs and delayed the start of others to avoid costly program stretch outs. But this restructuring in the face of fiscal constraints is not enough to ensure meeting our security requirements now and in the future.

It is imperative that we resume a commitment to stable, moderate growth in defense funding. The FY 1990-94 defense budget plan will do that. It reflects the same commitment to a strong, well-equipped, ready military force as that of the first defense budget presented by this administration in 1981.

b. The FY 1990-91 Defense Budget

(1) Overview

The FY 1990-91 budget has been structured to provide the best possible military force within the allotted resource level. It reflects the priorities we set last year in adjusting the FY 1989 budget and restructuring our programs in the face of continuing funding constraints and is balanced between people readiness and modernization (see Chart II.A.2). It re-establishes a steady, determined, and consistent plan marked by modest but essential real growth in funding.

The allocation of these budget resources reflects a careful evaluation of defense requirements. Nevertheless, continued funding constraints have forced us to accept increased risks. Our air and sea force levels have been reduced; some of our sustainability goals, espe-

Real Growth in Defense Budget Authority

Chart II.A.1
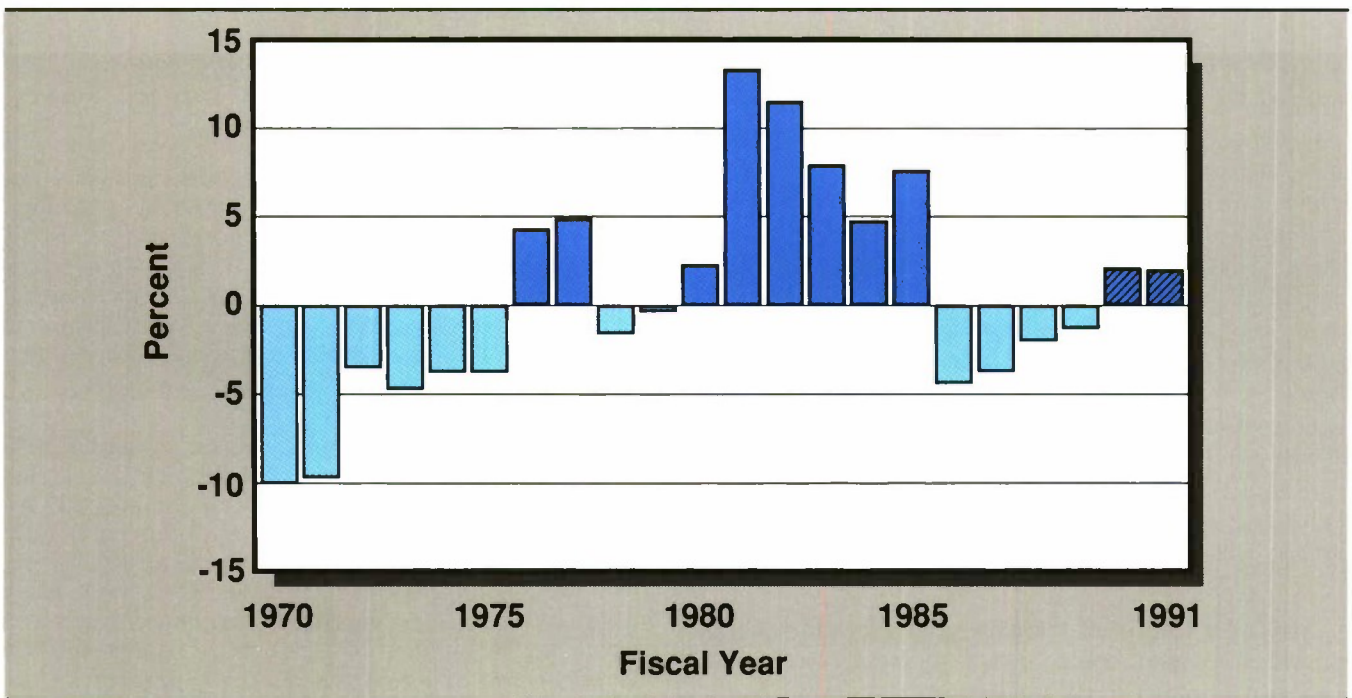
Department of Defense Budget Shares
(Budget Authority in FY 90 Dollars)

Chart II.A.2
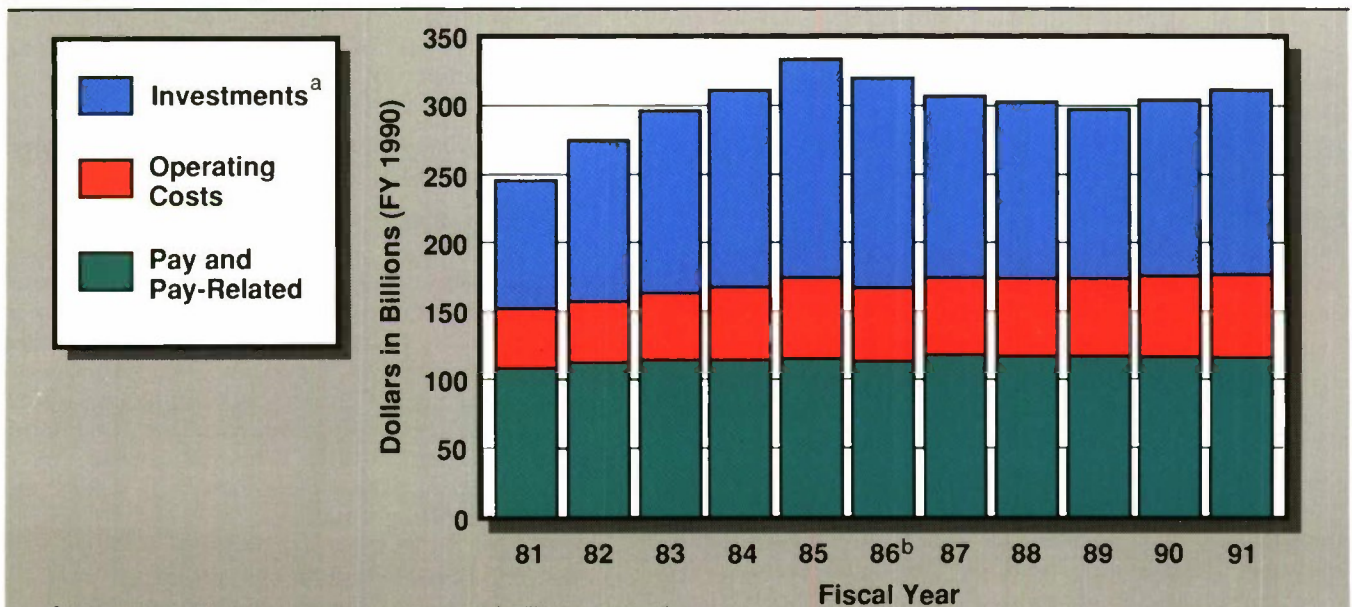
a Research and development, procurement, and military construction.

b A lower budget authority in the Military Accounts reflects the congressional direction to finance $4.5 billion for the military pay raise and retirement accrual costs by transfers from prior year unobligated balances.

cially ammunition for war reserves, are not fully supported; and our maintenance backlog will not be reduced. To minimize these risks, we made pragmatic choices to preserve the ability to support our national security policy objectives. In addition, we aggressively pursued management initiatives that will allow us to buy more efficiently as well as maximize our purchasing power. These initiatives, however, will only succeed if we maintain adequate funding levels. Further funding reductions would require an extensive reassessment of the level, type, and quality of forces that we can deploy in the future.

(2) Components of the FY 1990-91 Defense Budget

The President's biennial defense budget for FY 1990-91 proposes $305.6 billion for FY 1990 and $320.9 billion for FY 1991 (see Table II.A.1). Appendix A provides budget data by appropriation title and by component.

The distribution of FY 1990 and FY 1991 budget authority by major appropriation title is shown in Chart II.A.3. Military Personnel (including payments to military personnel and the accrued retirement cost of the current military force) and Operations and Maintenance (O&M) (including allocations for civilian personnel, maintenance and repair of equipment and for utilities, medical costs, training, fuel, and consumable spare parts), comprise about 56 percent of DoD budget authority. The remainder of the budget contains funds for investment in research and development (R&D), procurement of weapon systems, military construction, and family housing.

Outlays in FY 1990 and FY 1991 (see Chart II.A.4) are primarily for current year operations (6.5 percent and 6.7 percent, respectively), pay (44.7 percent and 44.5 percent, respectively), and prior year requirements (37.5 percent and 37.6 percent, respectively). Current year operations cover base structure and support costs. Outlays from prior year programs represent amounts already on contract and are largely a function of procurement and R&D investments made in previous years. Only 11.3 percent will be spent on new investment programs in FY 1990 and 11.2 percent in FY 1991.

Maintaining a military force of quality personnel and continuing a strong commitment to their welfare and that of their families remains a major concern. Therefore, we have proposed military pay raises for the men and women serving in our armed forces to ensure that the pay gap between the private sector and the military does not grow wider. The FY 1990-91 budget also includes programs designed to maintain the near-

Department of Defense Budget
(Dollars in Billions)

Table II.A.1

	FY 1988	FY 1989	FY 1990	FY 1991
Current-Year Dollars				
Total Obligational Authority (TOA)[a]	288.6	292.7	306.6	321.7
Budget Authority (BA)[b]	283.8	290.2	305.6	320.9
Outlays[c]	281.9	289.8	293.8	304.7
FY 1990 Dollars				
Total Obligational Authority (TOA)[a]	307.9	301.5	306.6	312.6
Budget Authority (BA)[b]	303.1	299.3	305.6	311.9
Outlays[c]	303.0	300.8	293.8	295.2

[a] **Total Obligational Authority (TOA)** represents the value of direct defense programs for each fiscal year, regardless of financing.

[b] **Budget Authority (BA)** permits the obligation of funds for immediate and future disbursement and is associated with the year the authority takes effect. Generally the difference between TOA and BA stems from the application of receipts that offset total budget authority.

[c] **Outlays** represent actual expenditures. About 63 percent of FY 1990 outlays will result from FY 1990 budget authority; the remainder will come from budget authority provided in earlier years.

Department of Defense Budget Authority
(Dollars in Billions)

Chart II.A.3

RDT&E $41.0
Other $9.0
Procurement $84.1
Military Personnel $79.8
Operations and Maintenance $91.7

FY 1990 Budget Authority $305.6

RDT&E $41.3
Other $10.1
Procurement $91.9
Military Personnel $82.1
Operations and Maintenance $95.5
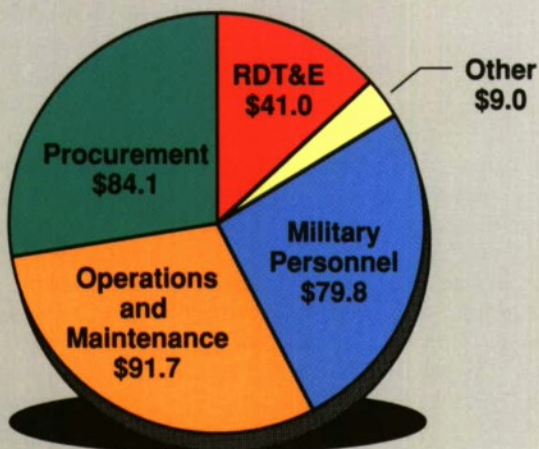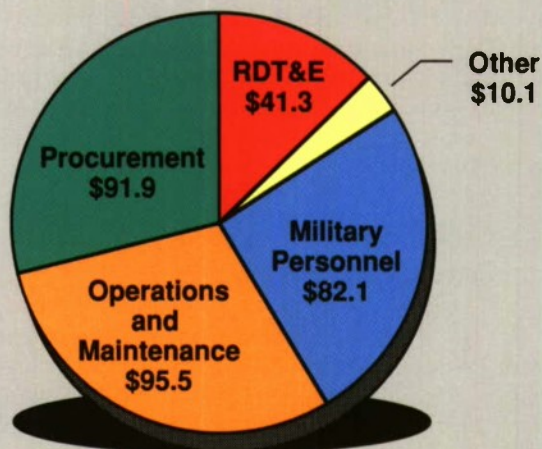
FY 1991 Budget Authority $320.9

Department of Defense Outlays
(Dollars in Billions)

Chart II.A.4

Current Year Investment $33.2
Current Year Operations $19.0
Prior Year Programs $110.1
Pay and Pay-Related* $131.5

FY 1990 Outlays $293.8

Current Year Investment $34.2
Current Year Operations $20.3
Prior Year Programs $114.7
Pay and Pay-Related* $135.5
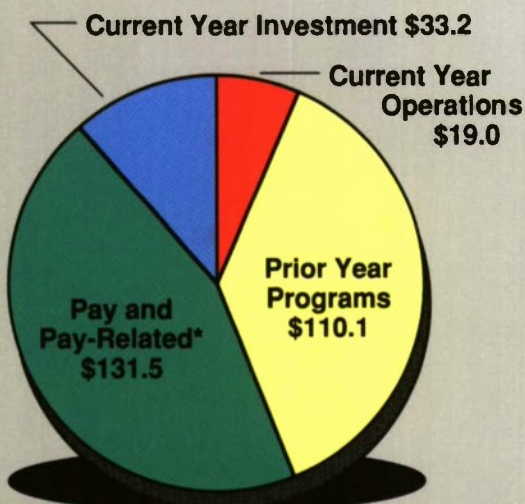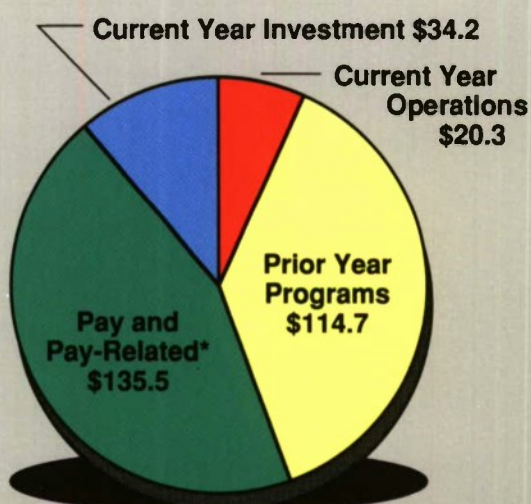
FY 1991 Outlays $304.7

*Includes retired pay accrual costs.

term readiness of our forces to perform assigned missions and expand through mobilization.

3. Budget Stability, Predictability, and Reform

a. Opportunities for Long-term, Steady Growth

Stable and timely defense funding is the key to providing an adequate defense posture. To understand this point, one need only look at the costly catch up required in this decade as a result of the dramatic decline in defense funding during the early and mid-1970s. The current four-year real decline in defense funding could indicate a return to this trend of instability. Without stable, moderate funding growth, we can neither protect our gains nor guarantee that our weakened defense posture can support our security commitments. In addition, such spending declines ensure the eventual necessity to engage in yet another costly investment program to rebuild our defense. When that time comes, however, the time and the resources required to restore our weakened deterrent may not be available.

Not only must we ensure modest, consistent real increases in defense funding in current and future budgets, we must also take the necessary steps to ensure the stability of individual programs. Program stability contributes to reducing total program costs while facilitating long-range planning. The major factors of program stability are: firm development schedules, set specifications, consistent funding, and steady production rates. Multiyear procurement (MYP) and economic production rates utilize all of these factors effectively.

MYP has yielded significant savings since its inception in 1981 through economical buys and by reducing the uncertainty inherent in single-year funding (see Chart II.A.5). Approved MYP programs from FY 1982 through FY 1989 will produce savings of $9.0 billion. In the FY 1990-91 budget, we are proposing a significant increase in the use of multiyear procurement by requesting special funding for 32 programs, which include: the Bradley fighting vehicle, DDG-51 AEGIS destroyer, F-15 aircraft, DSP satellite, the family of medium tactical vehicles, and the B-2 bomber. Total savings for all FY 1990-91 MYP programs are estimated to be over $8.5 billion through FY 1997. This includes $0.7 billion for the M-1 tank, which was approved in FY 1989, but for which a contract will not be awarded until FY 1990.

Higher production rates mean lower unit costs because equipment and manpower are not allowed to stand idle. The results are valuable savings and more efficient program execution. We have made a con-

Multiyear Procurement Savings*

Chart II.A.5
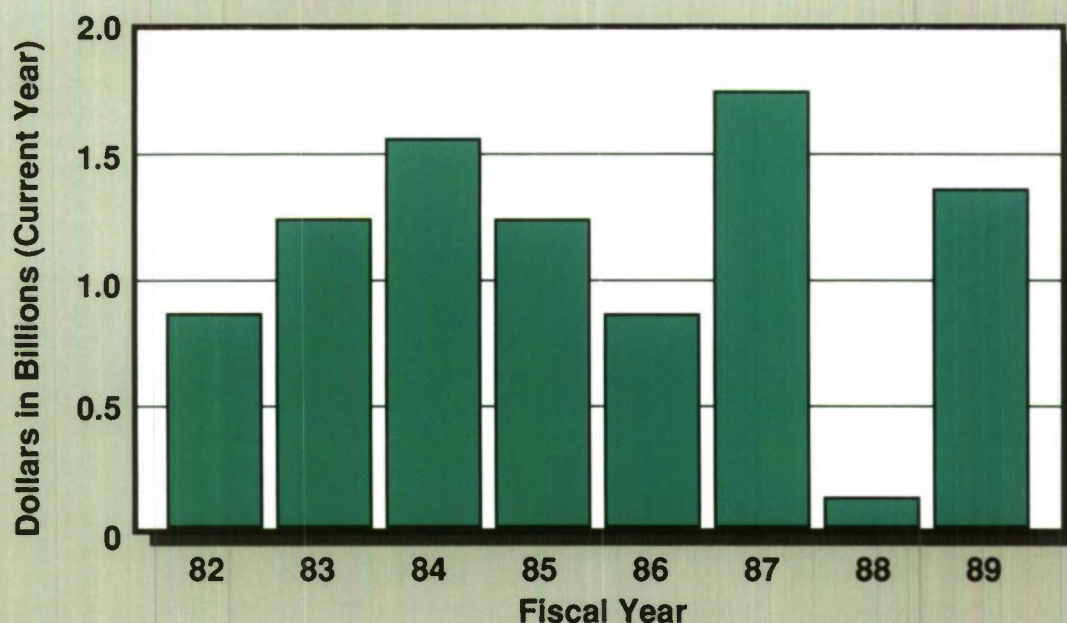
*Estimated savings based on programs approved by Congress during FY 1982-89.

scious effort to ensure that major weapon systems requested in the FY 1990-91 budget are bought at economic rates of production. Only those systems that are in early stages of production, building up to an economic rate, undergoing configuration changes, being bought out, or impacted by other nonfinancial reasons are not at economic rates.

b. Budget Reform

If a military force capable of successfully executing our national security strategy is our goal, and stability and predictability in defense funding is the way to reach that goal, then a timely and responsive congressional budget review is essential to the success of our efforts. Congressional consideration of defense requests has taken a disturbing turn in recent years. Not only does the defense debate in the Congress now often hinge on issues other than national security, but reasonable and decisive congressional review of the defense budget often has given way to delays and indecisiveness. Unclear delineation of responsibilities between the authorization and appropriation committees results in a duplication of effort that is burdensome for the Congress and the Department. In addition, defense authorization and appropriation legislation has become burdened with restrictions that delay congressional action and threaten the achievement of defense objectives. This congressional micromanagement has precluded the Department from receiving the necessary level of defense resources on a timely basis. It also has often hindered our flexibility in allocating resources and executing programs in ways designed to improve efficiency and effectiveness.

There are, however, encouraging examples of mutual cooperation. The Congress's recent support for the newly established "Commission on Base Realignment and Closure" demonstrates that we can work together to identify an optimum approach to meeting defense needs. I am also very encouraged by the fact that the Congress was able to pass and send the FY 1989 DoD Authorization and Appropriation Bills to the President before the beginning of the new fiscal year. This enabled us to avoid the uncertainty of operating under a continuing resolution. It underscores my belief that the Administration and the Congress can work together. This spirit of cooperation must be extended to other critical proposals that, if implemented, would enable us to ensure stable and predictable defense funding.

A very important contribution to budget stability would be the enactment of authorizations and appropriations for two fiscal years. Biennial budgeting was strongly recommended by the President's Commission on Defense Management and is required by the FY 1986 Defense Authorization Act. A two-year commitment to a specified level of defense resources en-

hances program stability and increases economical procurement alternatives. Materials and components can be purchased more efficiently and economically by ordering in bulk quantities earlier in the contract period. This is especially true of long-lead components. The assurance of two years of production should also attract additional competitors for defense programs who may not have deemed it cost effective to tool and train for only one year's effort. It would also help us to strengthen the defense industrial base. Biennial budgeting also would provide additional time for the Congress and the Executive Branch to focus on resolving policy issues and establishing priorities. Even though the Congress failed to act on our FY 1988-89 biennial request as a whole, it has expressed continued support for the concept of biennial budgeting. Therefore, the Department has institutionalized the two-year cycle of planning, programming, and budgeting defense requirements.

The Congress could further stabilize the procurement process by continuing to fund additional defense programs on a multiyear basis, as proposed in this year's budget. Most major weapons require years to research, design, develop, and build. Once approved by the Congress, these programs should not be submitted to the uncertainties of annual funding approval.

4. Affordability of Defense Spending

a. Defense Spending and the Deficit

The affordability of defense is often obscured by issues that, while unrelated to the threat to our security, nevertheless drive budgeting policy. The most visible of these issues currently is the federal budget deficit. The pressure to reduce federal spending in the wake of continuing high budget deficits has focused inordinate attention on cutting defense spending. The perception that the defense budget is inflated has led to the view that defense spending is the principal cause of the federal deficit and should therefore be reduced. There is, however, little evidence to support the notion that a reduction in defense spending will restrain deficit growth. During the 1960s, for example, when almost 50 percent of the federal budget was devoted to defense, federal deficits were almost nonexistent (see Chart II.A.6). Yet in the 1970s, when defense accounted for 25 percent of federal spending, the deficit was on the rise.

Indeed, just as economic goals were not achieved in the 1970s by cutting defense, they are not being achieved now by similar action. Large reductions to defense requests have not lowered total federal spending significantly because nondefense spending has largely offset defense decreases. In fact, between 1982

Federal Budget Shares and the Deficit

Chart II.A.6
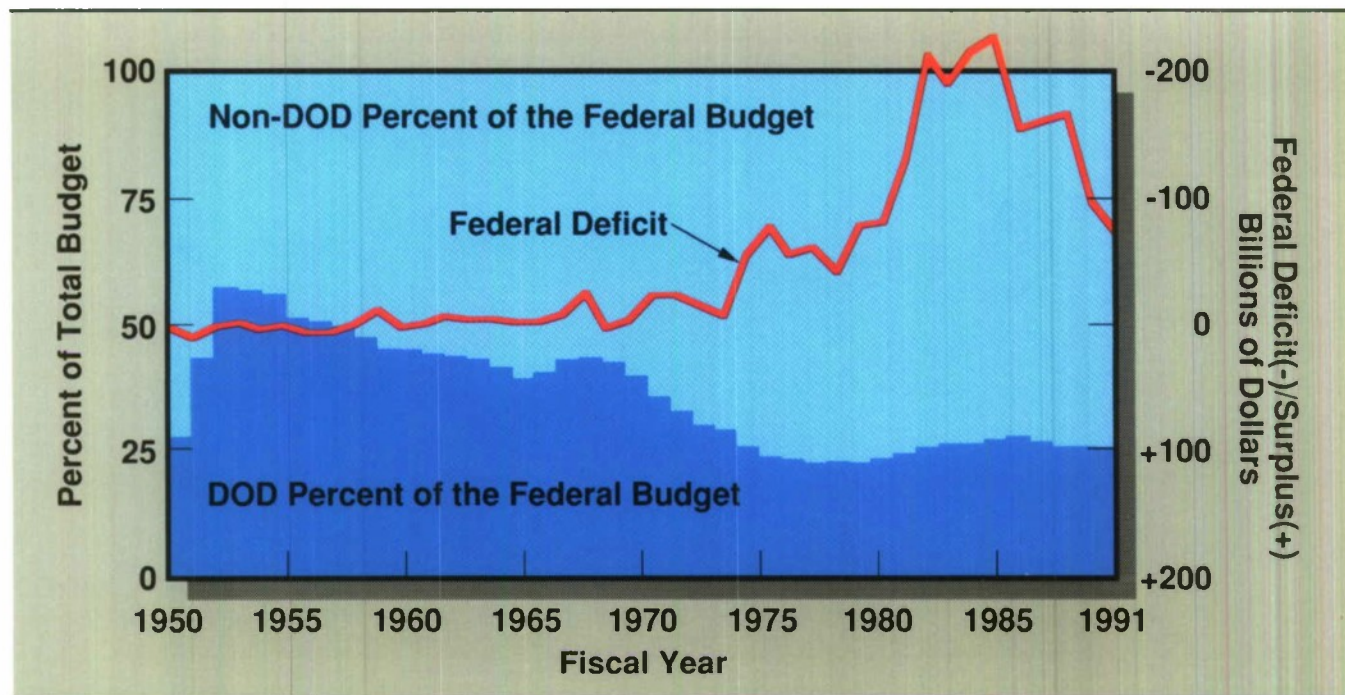
and 1987, nondefense outlays increased at over twice the rate of cuts to defense outlays.

While defense reductions have not changed the federal deficit significantly, they have had a definite adverse impact on our defense capabilities. We have had to reduce personnel levels and force structure, defer achievement of sustainability goals, and delay the start of some important defense programs. These actions have been necessary to ensure that our existing force will remain at acceptable levels of readiness. Further cuts will jeopardize those areas we have sought to protect and could produce serious declines in readiness and the military quality of life while undermining efficient acquisition.

b. Defense Shares of GNP and Federal Spending

Some critics also argue that we cannot afford to devote the requested share of our national economic resources (the gross national product, or GNP) to defense. Based on national security requirements and current economic growth projections, we estimate that only about 5.4 percent of the GNP will be required for defense in FY 1990 and 5.2 percent in FY 1991 (see Chart II.A.7). This is far below the 8 percent of GNP invested during the early 1960s and only slightly more than the average investment in defense during the

1970s. It is also only about one-third the share of national wealth the Soviets allocate to defense.

Others contend that the recent defense buildup was funded at the expense of vital domestic programs. This is simply not true. The growth in defense spending from 1981 to 1985 reversed a long-term trend of no growth in defense budgets (see Chart II.A.8). Yet nondefense spending has grown consistently during the entire period; in fact, even the growth in defense from 1981 to 1985 did not match the continuing increases in nondefense growth.

5. Conclusion

The FY 1990-94 defense budget levels were established to provide adequate resources for defense today and to provide the basis to deal with the threats of tomorrow (see Table II.A.2). We have assessed our program's affordability in the outyears. It has been structured to buy as much capability as possible, while ensuring that we can meet our day-to-day operating requirements. Reducing this program implies accepting increased risks to our security, today and in the future -- annual real decreases in defense spending will fail to preserve our security posture.

Even though we have rebuilt our defense capabilities, the time for vigilance has not passed. Our re-

Defense Outlays as a Share of the Gross National Product

Chart II.A.7
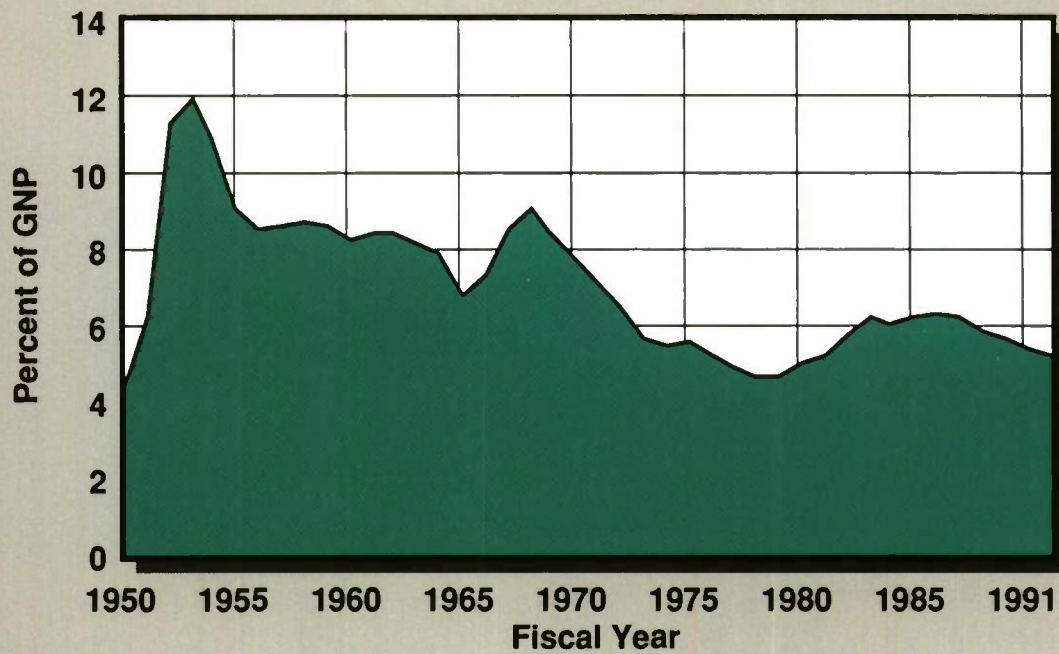
Total Federal Outlays

Chart II.A.8
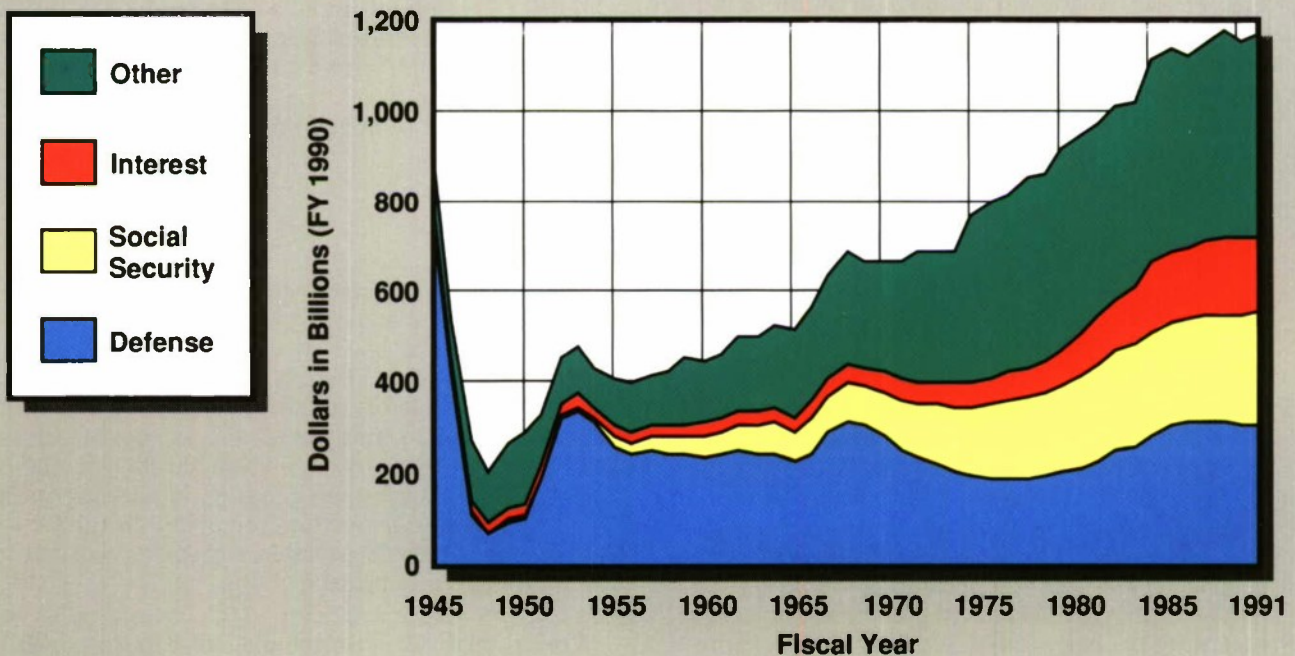
FY 1990 - 91 Department of Defense Budget Long-Range Forecasts (Current Dollars in Billions)

Table II.A.2

	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994
Total Budget Authority	305.6	320.9	335.7	350.7	365.6
Percent Real Growth	2.1	2.0	2.0	2.2	2.0
Total Outlays	293.8	304.7	316.2	329.3	343.4

stored capabilities must be sustained and even strengthened to remain a credible deterrent. In the final analysis, the key to preserving an effective and ready fighting force and ensuring our ability to meet future threats rests in a shared commitment by the Administration and the Congress to restore predictability and stability in defense funding.

B. DEFENSE MANAGEMENT

The objective of DoD management is to make the best use of our resources to provide the means to preserve our national security in peace and in war. This is a challenge of significant magnitude. The Department employs 1 million civilian and 2 million active duty military personnel, manages 1200 installations spread around the globe, and for FY 1990 is submitting a budget that would give it the authority to spend $293.8 billion. DoD executes more than 15 million contract actions each year. Last year, the total value of those contracts reached $160 billion.

This administration has met DoD's management challenge head-on by creating a management process that works. This process has two complementary elements. We strive to improve management through various plans and programs while creating an environment that inspires administrators to manage creatively. At the same time, however, we set in place sufficient rules, controls, and checking mechanisms to identify ineffective and improper management practices.

While we have taken major steps to achieve high levels of efficiency and effectiveness in the management process, we recognize that the system is not perfect, and we are constantly seeking ways to improve. This chapter outlines our approach to improving the management process, including acquisition reforms and DoD management controls.

1. Defense Management Improvement Process

The Department uses a number of approaches to achieve its management objectives. Collectively, they comprise the defense management improvement process. First, we have strengthened the DoD Council on Integrity and Management Improvement (DCIMI) to focus its efforts on key management issues. Second, we established a process to identify the most significant issues and to prioritize them. Third, we have identified key management issues throughout DoD through the Management Improvement Plan. Fourth, we focused our attention on acquisition reforms as a major area of overall DoD management. Fifth, we have continued to strengthen our Internal Management Control Program that has resulted in the correction of 89 percent of weaknesses identified since FY 1983.

a. DoD Council on Integrity and Management Improvement

Since the DCIMI was established in 1981, it has been a cornerstone in the Department's management improvement process. This senior level forum, chaired by the Deputy Secretary of Defense, acts as a corporate board of directors for management issues.

At its meetings, the DCIMI reviews key management issues, focusing on those that are critical to effective mission accomplishment. This past year, some key DCIMI actions were:

- Directing and monitoring the Department's efforts to reduce the number of financial accounting systems. DCIMI has also been instrumental in focusing top management attention on ensuring that accounting systems meet GAO standards and principles.

- Continuing to oversee the Management Improvement Plan and the Productivity Improvement Plan. In FY 1988, much effort was put into defining the management and productivity initiatives and in developing productivity measurement criteria.

- Approving the DoD Annual Statement of Assurance. This includes identifying major material weaknesses within the Department, approving planned corrective actions, and overseeing correction implementation.

b. DoD Critical Issues Identification and Correction Process

The DoD critical issues identification and correction process is designed to identify key management issues/weaknesses and set priorities among them, recommend and oversee implementation of corrective actions, and provide feedback regarding improvements to the process.

The first step of this process has been implemented, resulting in a listing of high priority management issues that include financial control, contract control, logistics management, force readiness, health care, hazardous material, and manpower, recruitment and retention. This list is designed to provide critical issues that will be selected for review by top management and the DCIMI.

c. DoD Management Improvement Plan

The Management Improvement Plan is designed to address systematically those key issues which have been identified for top management attention and action. The FY 1989 Plan has seven major goals supported by 38 initiatives. A discussion of our progress in several key initiatives follows.

(1) Acquisition Management

Many effective acquisition management initiatives, including total quality management, acquisition streamlining, and government-owned industrial property, have been initiated during this administration. A more complete discussion of these initiatives appears in the industrial base chapter of this report (see Chapter II.E). Other acquisition initiatives covered in the Management Improvement Plan include:

(a) Spares Program Management

The Spares Management Improvement Program was begun in 1983 to improve the way we purchase and manage spare parts. Some of the major actions include:

- Adopting over 500 initiatives that have changed fundamental attitudes and approaches to spare parts management. We now routinely examine several sources for replenishing stocks, severely restricting use of sole source suppliers.

- Promoting increased competition, and challenging prices that appear to be unrealistically high.

- Reviewing 183,173 items during FY 1988 as part of a comprehensive "breakout" program to find sources for parts other than the prime contractor.

- Publishing a comprehensive, logistics strategic plan for the Department. By establishing an orderly plan for managing logistics, we will avoid many spare parts problems and other logistics shortfalls. These actions, among others in the program, have produced savings or cost avoidance of over $6 billion over the last five years.

(b) Contract Administration

Our efforts in contract administration are designed to ensure that a contractor complies with his contractual commitments and that the government's obligations are met. These efforts include performance and delivery monitoring, quality control and testing to ensure contract specifications are met, performance ac- ceptance, billing and payment, and additional actions protecting the government's interests.

When we identify a problem, either through DoD's internal management control program or other management sources, corrective actions are implemented. The Under Secretary of Defense (Acquisition) uses the Joint Contract Administration Coordinating Council (JCACC) as the vehicle for pursuing improvements in the contract administration arena.

The JCACC provides advice, counsel, and assistance on contract administration objectives. It seeks to ensure consistency in contract administration policies by reducing duplication of effort. The JCACC also pursues contract administration initiatives to focus management attention on areas that are occasionally overlooked.

(2) Financial Management

(a) Financial Management Systems

We have continued to upgrade financial management and accounting systems by reducing the number of systems to meet the DoD goal of one per military department and one for all defense agencies. This is enhancing our ability to share information, thereby improving resource allocation. Since the passage of the Federal Managers' Financial Integrity Act of 1982, DoD has reduced the number of accounting systems not meeting GAO principles, standards, and related requirements from 98 to 22, a 78 percent reduction. In addition, we have reduced the number of operating accounting systems from 154 to 85, a reduction of 45 percent. Current projections are that 24 more accounting systems will be eliminated in FY 1989 and 34 more in FY 1990 as shown in Chart II.B.1.

(b) Cash Management

A variety of initiatives has been undertaken to improve cash management. Emphasis is being placed on three major objectives: accelerating collections and deposits, effecting more timely disbursements, and reducing cash holdings. The Department has identified 42 new cash management initiatives for FY 1989, to include: the electronic transfer of payroll allotments to insurance and financial institutions; the use of bank lockboxes to speed the availability of deposited funds; acceptance of credit cards for purchases made by the public; and the payment of vendors via electronic funds transfer.

Last year, particular emphasis was placed on accepting credit cards from the public for the sale of goods and services. DoD personnel and the public will be able to use credit cards to pay for items such as

Reduction in DoD Accounting Systems

Chart II.B.1
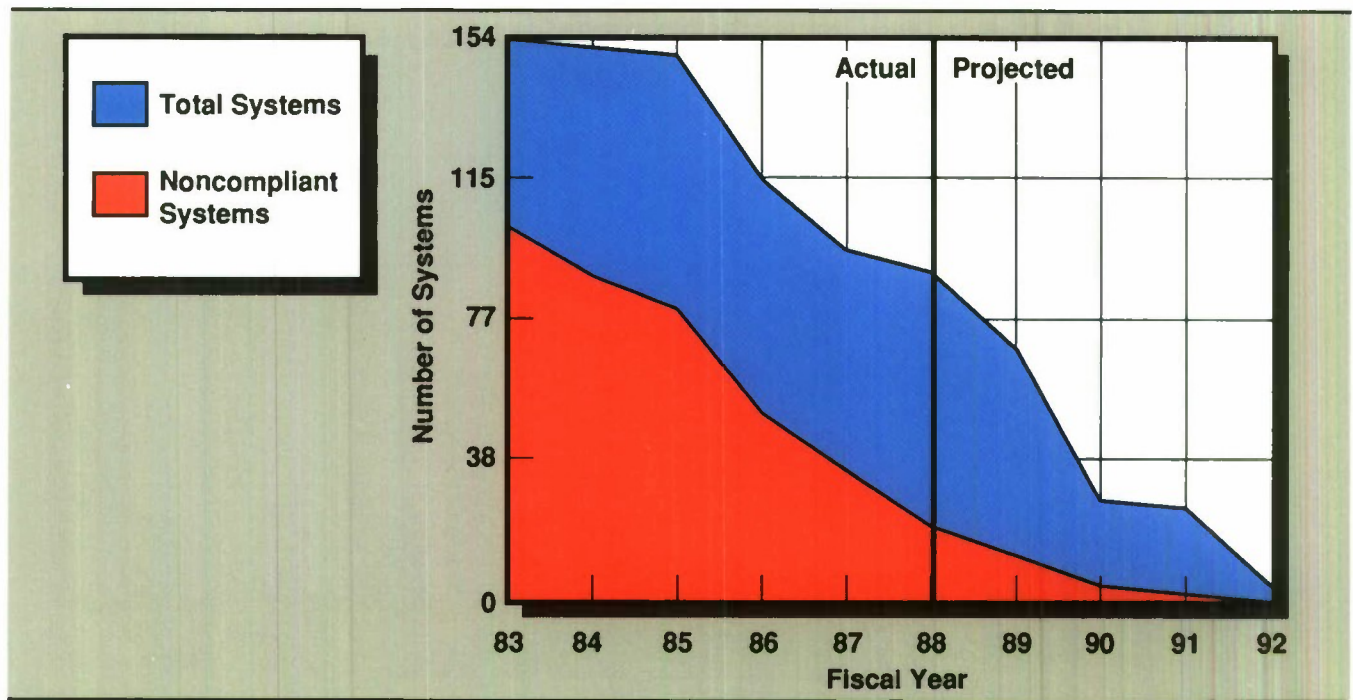
medical services, maps, recreational camp fees, surplus items, and out-of-service debt. Acceptance of debit cards (i.e., plastic substitutes for cash and checks) at commissary point-of-sale cash registers is being investigated as well.

These initiatives are expected to provide savings to DoD and the Treasury of $145 million in FY 1989. The result will be a cumulative savings of $854 million resulting from initiatives implemented by various defense components since the program's inception in FY 1983 (see Chart II.B.2). Actual results have exceeded Defense goals by 22 percent.

(c) Debt Management

Seventy-five debt management initiatives have been identified for action in FY 1989 and FY 1990 to improve the collection of Defense Department debts and reduce the amount of outstanding delinquent receivables. Examples involve salary and federal income tax refund offsets, collection agency and credit bureau referrals, and assessment and collection of interest.

We have accelerated government-wide computer identification of individuals now working for DoD who have not repaid loans previously contracted with other

government agencies. Once these individuals are identified and notified, approval is obtained to offset the amount of the loan by deducting it from the individual's paycheck. Salary offsets of DoD members amounted to almost $8 million during FY 1988 for the Veterans Administration and the Departments of Education and Housing and Urban Development. Action was also taken to improve salary offsets of debts owed to DoD. Since FY 1985, the Department has collected over $15 million for other federal agencies through the offset of its employees' salaries. Over 52,000 DoD accounts were matched, resulting in the identification of 4,400 debt accounts for salary offset by Defense and other federal agencies.

The Department continues to refer debts aggressively to the IRS for federal income tax refund offset. Collections in 1988 amounted to $18 million, reducing DoD debt by $35 million in two years. Since new legislation has extended the federal income tax refund offset program to 1994, an agreement between DoD and the IRS has been executed for the offset of Defense debt accounts in 1989 as well. Results for 1989 are expected to reach $20 million based on an increase in debt referrals to $145 million. This will provide a cumulative impact of reducing DoD debt by $55 million in three years (see Chart II.B.3).

Cumulative Cash Management Savings

Chart II.B.2
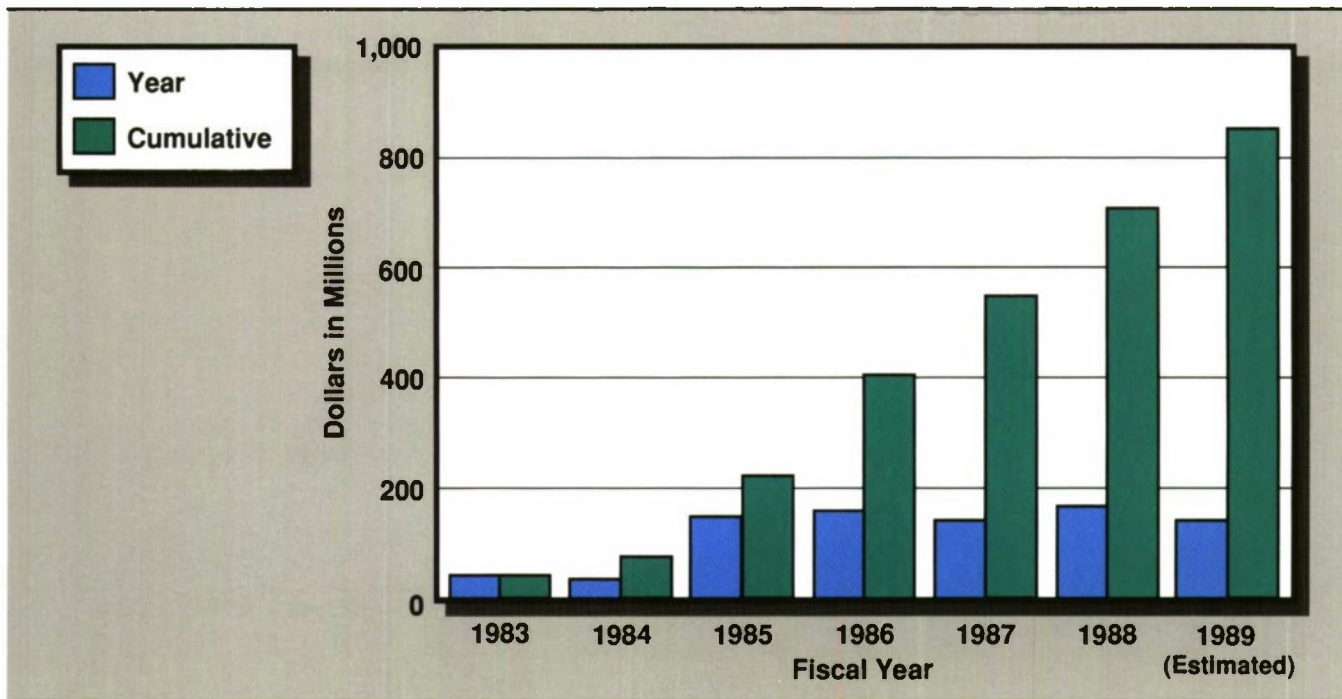
Cumulative Federal Income Tax Refund Offset

Chart II.B.3
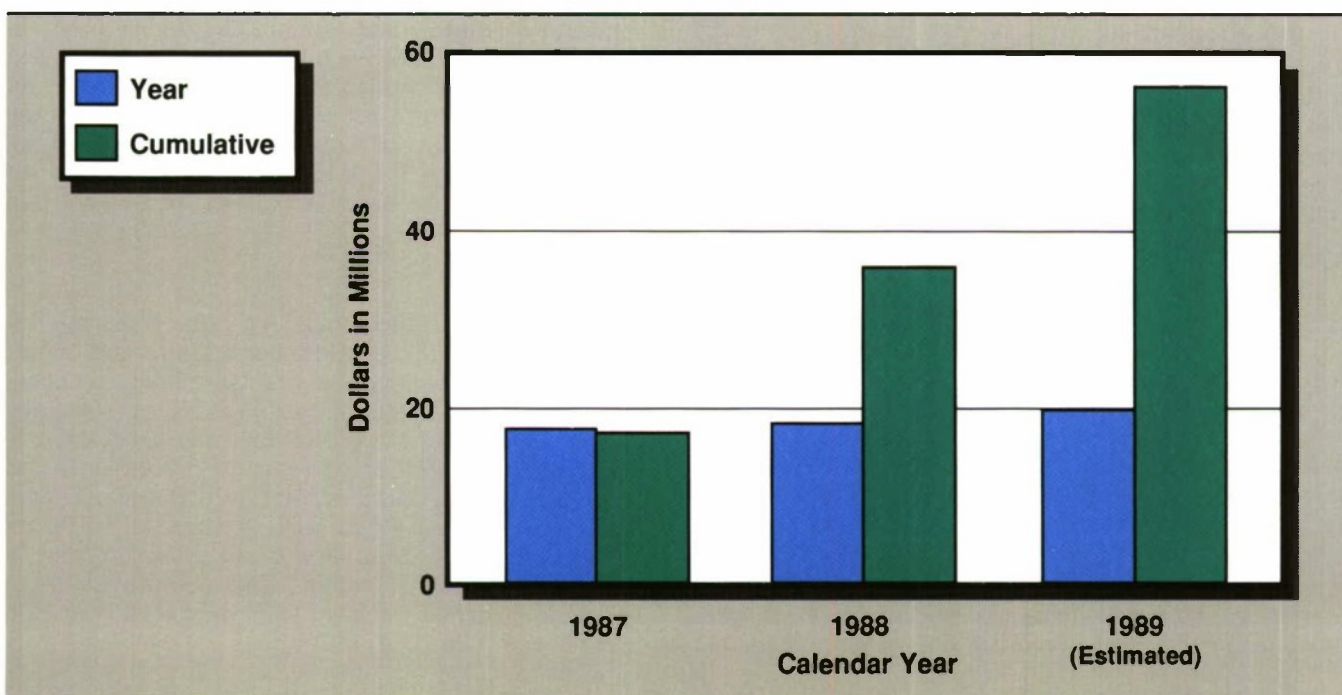
During the past year DoD has used the services of six new professional debt collection contractors. We continue to refer debts to private credit reporting bureaus to help reduce bad risk extensions of credit throughout the government.

(3) Productivity and Quality

On April 27, 1988, Executive Order 12637 set a government-wide three percent productivity improvement goal for appropriate functions. To implement the Executive Order, we established the DoD FY 1990 Productivity Improvement Plan, which contains 53 initiatives covering over 560,000 military and civilian personnel working in DoD functions and programs valued at approximately $31 billion. Furthermore, DoD is vigorously implementing the philosophy of Total Quality Management (TQM) as a prime means to increase productivity through continuous, incremental improvements in quality.

We are continuing to pursue initiatives that include efficiency reviews, capital investment, and commercial activities. We give managers the tools and techniques to make improvements. One such tool is the Efficiency Review process which identifies the essential tasks of an operation and determines the most efficient method for accomplishing them. Since FY 1982, over 1,100 efficiency reviews have been completed, with resource savings of 7,000 manpower spaces and $217 million. We are continuing our Productivity Enhancing Capital Investment Program to improve the efficiency of operations through the use of modern technology. This program specifically targets funds for quick return and long-range high-payoff investment initiatives. For instance, investments planned for FY 1990 of $140 million are expected to average lifetime savings of approximately $36 for each $1 invested. Finally, the Commercial Activities Program cost compares commercial-type work currently done by DoD employees with bids from the private sector to determine the most cost-effective source. In FY 1988 this program produced savings in excess of $110 million.

DoD also encourages individual initiative to improve productivity. Over the past six years, 1,295 individuals have been recognized for their contributions to productivity improvements, resulting in savings exceeding $1.48 billion.

d. Acquisition Reform

The issue of how best to manage the procurement process has been highlighted by the current Justice Department investigation into Defense contracting. As the investigation continues, pressure is building for what is called procurement reform. Our challenge is to make certain that whatever reforms we make are truly re-

forms and actually improve the system. Unfortunately, some of the reform proposals now circulating on Capitol Hill would create a new and different set of problems. Several -- particularly those aimed at creating an independent acquisition agency, removing the Inspector General from the Defense Department, and sealing shut the so-called "revolving door" between the Defense Department and Defense contractors -- would do far more harm than good. We need to examine our reforms thoroughly to ensure that change does not produce adverse, unintended consequences. This is not to suggest that reforms are not needed, but an impulsive legislative rush to reform could be counterproductive.

It is important that current effective acquisition methods not be disrupted. For example, during this administration we have dramatically reduced the cost of acquiring major weapon systems, as shown in Chart II.B.4. We also have streamlined the acquisition process by eliminating red tape and increasing competition for defense contracts. As shown in Chart II.B.5, the Department's competed procurement dollars in FY 1988 amounted to $79 billion -- an increase of $31 billion over FY 1983.

We also have addressed socio-economic issues through various considerations in the placement of DoD contracts, to include new and innovative techniques for involving small disadvantaged businesses, new performance programs for Historical Black Colleges and Universities and minority institutions, and an emphasis on "buying American."

In addition to the current administrative bodies and regulations already in place to monitor the acquisition process, a task force has been formed to provide day-to-day oversight of the Justice investigation. This task force is co-chaired by the Under Secretary of Defense for Acquisition and the General Counsel. Its purpose is to plan for and guide our review of each source selection and contract that may be affected by the investigation. It will also identify any changes to our acquisition system that should be made as a result of what we learn from the investigation.

We are working to identify and eliminate any potential wrongdoing now. Remedies are already available to deal with "tainted" contracts. These range from equalizing the competitive effect of improperly released information to cancelling solicitations, terminating contracts, and suspending or debarring involved contractors. Some procurement reforms that have been developed to enhance the acquisition process include:

- A pre-award certification clause requiring certain contractors to certify that they have not improperly or illegally obtained source selection information.

Annual Rates of Program Cost Growth for Selected[a] Weapon Systems[b]

Chart II.B.4
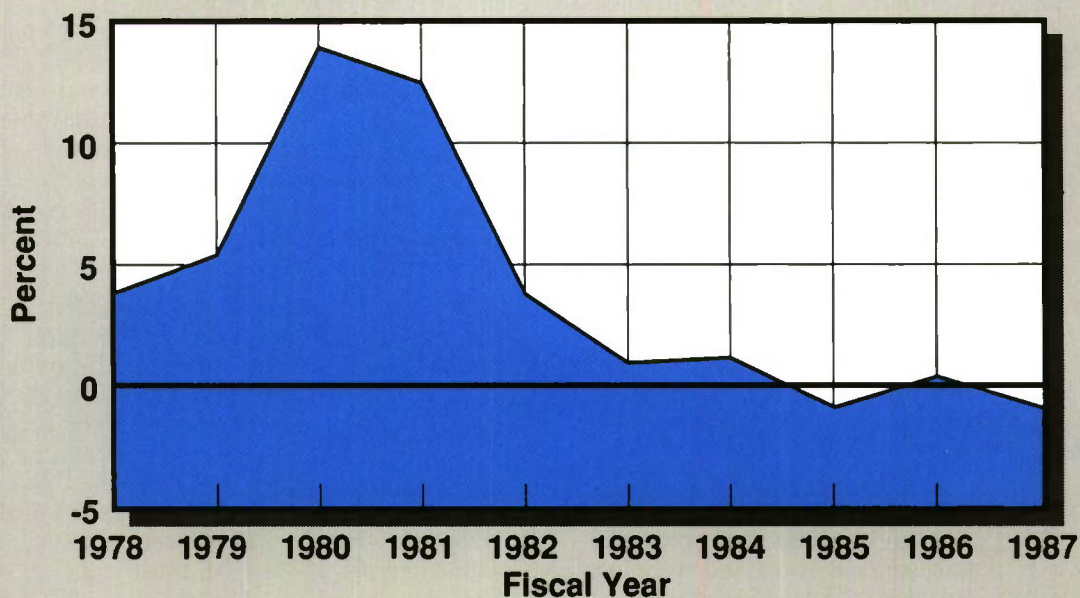
[a] Includes systems with minimum R&D costs of $200 million or procurement costs of $1 billion (1980 constant dollars).
[b] Excluding economic and quantity changes.

Competitive Contracting

Chart II.B.5
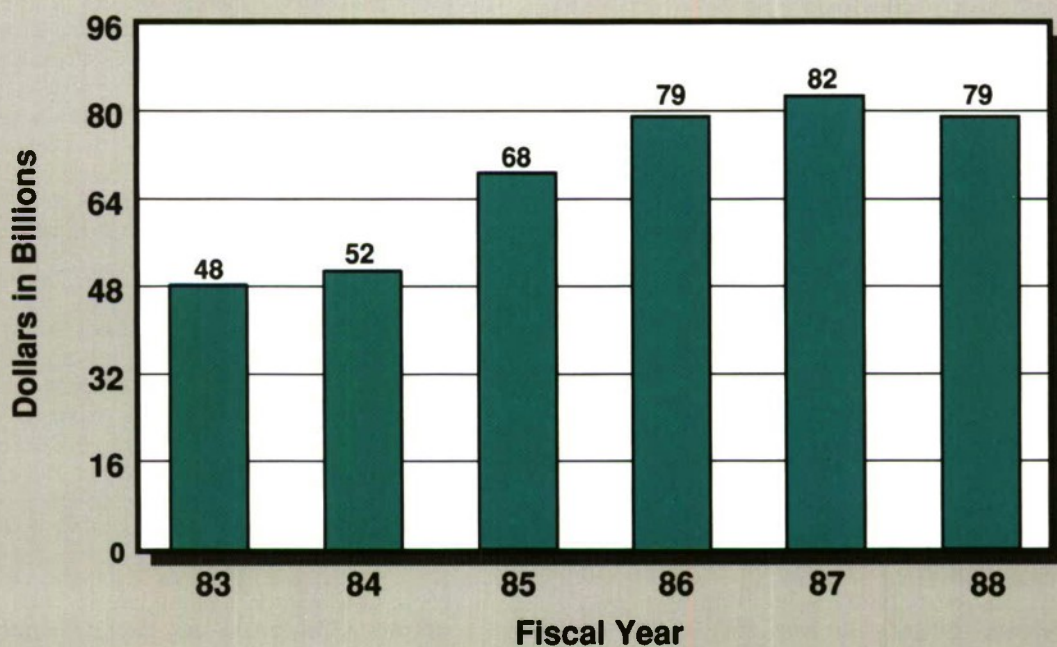
- A profit recapture clause, for use in contracts with specific contractors, allowing the government to recover the contractor's anticipated profit if we learn that the contract was won improperly or illegally.

- Emphasis on organizational conflict of interest coverage to ensure that consultants working for DoD are not performing work for private firms that conflicts with their DoD work.

- Eliminating most multiple requests for best and final offers in order to enhance the protection of sensitive source selection data, avoid auction techniques, and ensure fairness and promptness in contract awards.

e. DoD Internal Management Control Program

Internal controls provide checks and balances that assist in the prevention of fraud, waste, and mismanagement of government assets. The Internal Management Control (IMC) Program requires managers to systematically review the internal control of their systems. When problems are discovered, managers must develop and implement corrective action plans in a timely manner.

Our IMC program has been highly successful, due largely to the commitment of managers at all levels. Since the program's inception in FY 1983, we have corrected 339, or 89 percent, of the problems identified through FY 1987. Of these corrective actions, 60 were completed this year.

Stronger internal controls have resulted in improved contract quality assurance programs, improved accountability and control over government furnished material (GFM) provided to contractors, better control of contractor overhead costs, and improved management of war reserve stocks.

2. Defense Management Controls

In addition to an effective management improvement process, good management also requires DoD to support ethical conduct; provide an honest, fair, and logical acquisition process; support contracting officers in pre- and post-contract negotiations; provide effective contract auditing; and vigorously pursue, identify, and correct waste, fraud, and mismanagement when it occurs. This is accomplished through a series of control mechanisms.

a. Ethical and Legal Controls on DoD Personnel

Ultimate responsibility for proper and ethical conduct lies with the good judgment and honesty of each individual. To promote and clearly define ethical behavior for DoD employees, Executive Order 11222 sets down overall principles of business interaction and, in general, advises employees to avoid any appearance of impropriety. There are also a number of other statutes to guide government officer and employee conduct.

Every new DoD employee is made aware of Department ethics regulations through an orientation packet and personal briefing. Individual awareness is buttressed by two financial disclosure reporting systems. Employees with decisionmaking responsibilities below the Senior Executive Service (SES) level, or below the military grades of colonel (or Navy captain), file confidential reports of their financial interests. All individuals in the SES, and most political appointees, are required by statute to file detailed reports that are available for public examination. Furthermore, careful review by supervisors identifies areas where there may be potential for conflict of interest. Remedial actions that can be taken when this happens include divestiture of the interests, change of official duties, or disqualification. Supervisor reviews and remedial actions are followed by reviews of experts assigned by DoD ethics officials.

Finally, under the Standards of Conduct Program, each DoD component works in close coordination with the Standards of Conduct Office in the Department. Attorneys and ethics professionals are available to answer questions and resolve problems that surface from the review of financial disclosure reports.

b. Regulatory Controls on the Acquisition Process

One of the Department's primary goals is good procurement management. This task is formidable on the basis of volume alone. In FY 1988, DoD spent about $151.4 billion involving approximately 14.8 million actions. These actions ranged from off-the-shelf small dollar purchases, to billion-dollar purchases of sophisticated, state-of-the-art weapon systems involving complex contracting techniques. The sheer complexity and magnitude of this task provide numerous opportunities for problems to develop within the system. The current Justice Department investigation into defense contracting is the latest evidence that responsible and efficient management requires constant review of policies, procedures, and regulations.

There are many interacting pressures and interests that complicate the procurement process. The Department must respond to congressional interests and legislation, General Accounting Office rulings and concerns, public scrutiny, industry interests and pressures, court decisions, and the interests of other government agencies. These pressures and interests are ever-changing and often in conflict with each other.

Several actions have been taken by the Department to improve oversight of the acquisition process. The Defense Acquisition Board has been instrumental in simplifying and streamlining the complex procurement process. The Board is comprised of the top acquisition officials from each military Service and serves as the clearinghouse and final checkpoint for all acquisitions that come to my desk. This consolidated chain of command replaces a cumbersome and complex system.

The Defense Acquisition Regulatory (DAR) Council is the forum in which contracting regulations applicable to the Department of Defense are discussed, developed, and maintained. It comprises highly experienced contracting experts from each of the Services and the Defense Logistics Agency. The DAR Council also discusses contracting issues with the Civilian Agency Acquisition Council, which represents the civilian government agencies.

We have regulations to help preserve the integrity of the acquisition process. DoD directives set forth experience, education, and training requirements for acquisition personnel; outline personnel standards of conduct; and address fraud, waste, and mismanagement. Additionally, DoD regulations contain extensive references to protection and disclosure of information, source selection procedures, and ethical business practices.

In the final analysis, good procurement requires that we protect the public interest, provide a reasonable set of rules for those individuals doing business with the government, provide guidance to thousands of contracting officers, and allow them flexibility to exercise good judgment.

c. Contract Auditing

The Defense Contract Audit Agency (DCAA) performs contract auditing and provides accounting and financial advisory services in connection with the negotiation, administration, and settlement of contracts and subcontracts for DoD procurement and contract administration activities worldwide. DCAA annually performs audits at approximately 15,000 contractor locations. These audits produced savings of over $61 billion from FY 1981 through FY 1988.

DCAA provides advice to procurement and contract administration officials on contractors' proposed costs, the incurred costs on existing contracts, and contractors' accounting and estimating systems. DCAA's efforts provide a reasonable degree of assurance that unlawful activity will be disclosed. From FY 1981 through FY 1988, DCAA reported 1,210 cases of suspected irregular conduct by contractors.

Significant weaknesses detected during DCAA reviews on internal controls involve highly automated Material Management and Accounting Systems (MMAS). These computerized systems are used by manufacturers to regulate the flow of parts, inventories, and costs among different accounts. MMAS minimizes company costs by having items readily available to meet production schedules. The flaws cited by DCAA involved procedures for moving material back and forth between accounts in a way that invited duplicate billings for the same item, inaccurate costing, improper progress payment requests, and defective pricing. In its initial review, DCAA found 23 contractors with deficiencies serious enough to withhold a total of $296 million. To correct this problem, a task force that included DCAA was brought together to develop compliance criteria for these systems. DCAA is now conducting reviews to assess contractor conformity with these criteria.

DCAA, along with the Under Secretary of Defense for Acquisition, and the DoD Inspector General, is a key player in the formulation of the Contractor Risk Assessment Guides (CRAG). This is a joint industry/government effort designed to encourage contractor self-governance and reduce government oversight in areas deemed to have adequate systems of internal control. This will free up auditors to concentrate on areas with higher payoff.

Another area that has received significant DCAA attention is contractor estimating systems. A major DoD concern is that defense contractors do not provide the Department with accurate, complete, and current cost data in price proposals. One problem has been the lack of specific and enforceable regulatory language governing the requirements for an adequate contractor estimating system. DCAA helped formulate a regulatory change that now clarifies system requirements language. This change will reduce the potential for defective pricing, and help ensure that contractors' estimating systems produce reliable cost estimates and projections.

DCAA has also reviewed consultant costs of selected major contractors to assure that inappropriate costs are eliminated from contract billings. In this area, DCAA played a vital role in proposing regulatory

changes that will strengthen the requirements regarding consultant cost allowability.

DCAA contract audits have produced some impressive results. For example, one DCAA review revealed major deficiencies in a contractor's material control and cost accounting system. Based on audits conducted over a four-year period, as well as a concurrent criminal investigation, the government reached a settlement with the contractor that involved redesigning his systems and refunding $85.9 million to the government.

d. The DoD Inspector General

Since FY 1982, the Department's Inspector General (IG) has aggressively sought to identify actions to reduce waste, fraud, and mismanagement. Our IG auditors have issued over 1,100 audit reports and have identified billions of dollars in potential monetary benefits. Over 100,000 internal audit recommendations have been adopted by DoD managers. The DoD has identified nearly $8 billion in savings from IG reports and $15.2 billion from Service audit reports.

Top priority is given to investigating potential criminal offenses that include product substitution; mischarging of costs; fraudulent defective pricing; and schemes which undermine the integrity of our contracting system, such as bribery, kickbacks, and antitrust

matters. Since FY 1982, the efforts of DoD investigators have generated over $1 billion in recoveries, fines, penalties, and civil settlements.

Powerful administrative tools, such as suspension and debarment of contractors, have increasingly been employed to protect the government's interests. Use of these measures has increased dramatically from 45 in FY 1982 to over 1,000 during FY 1988, as shown in Chart II.B.6.

The Inspector General, working with DoD management and industry, has pursued a vigorous prevention program against waste, fraud, and mismanagement. Over 250,000 personnel have received fraud awareness training. One major initiative is the Voluntary Disclosure Program, which encourages contractors to report suspected criminal wrongdoing and significant fraud and mismanagement problems. To date, the Department has received 113 disclosures where participating contractors voluntarily returned over $53 million to the government.

The Defense Hotline has proven its worth as an effective tool for reporting allegations of waste, fraud, or mismanagement. Since FY 1982, over 65,000 calls and letters have been received, resulting in over $85 million in savings.

Number of Suspensions and Debarments

Chart II.B.6
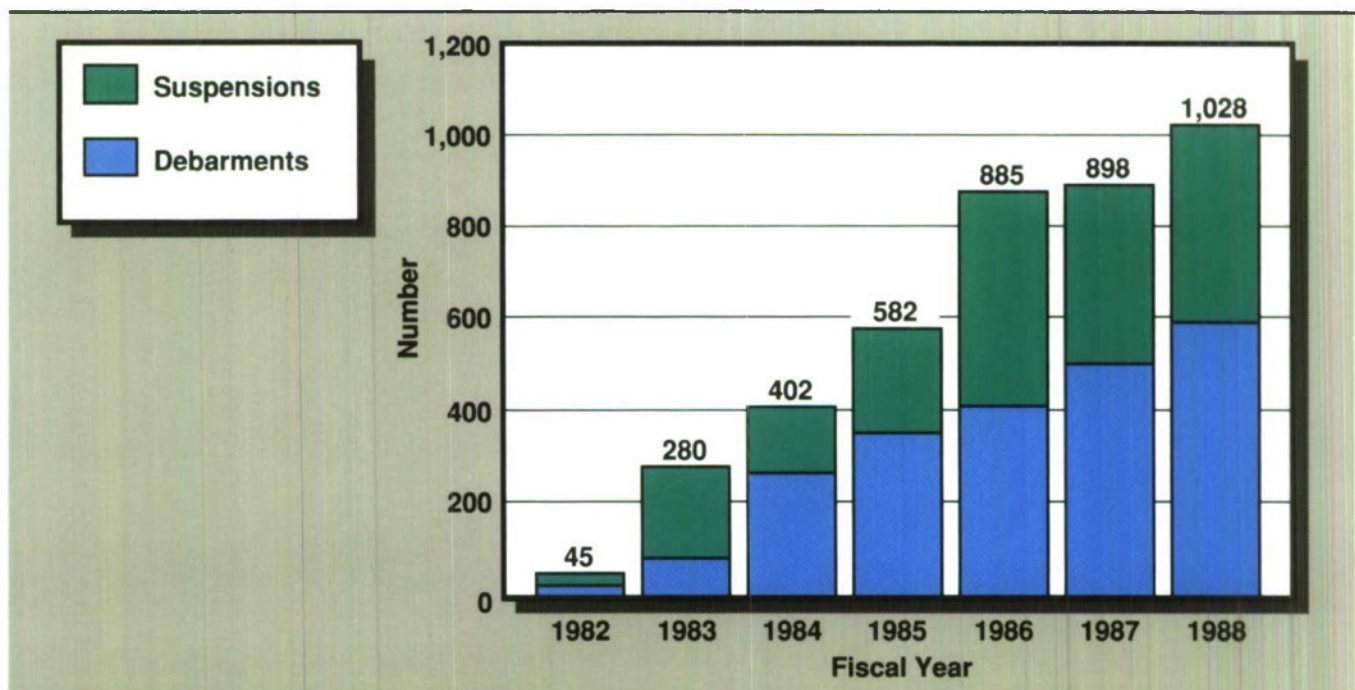
3. Conclusion

We must continue to build on the significant progress we have made in strengthening defense resources management. Yet we cannot do the job alone. We rely on the Congress as a key partner in the process to assist in several critical areas: providing adequate funds for authorized weapon systems and ensuring economies of scale and production; sending clear signals to defense program managers concerning the laws governing the procurement process; and supporting our efforts to improve management. Our management challenge is to work with the Congress toward our common goal of management excellence and efficiency.

C. MANPOWER, HEALTH CARE, AND ANTI-DRUG PROGRAMS

1. Introduction

The success of any defense strategy, no matter how well-crafted, depends on the quality and commitment of the people assigned to its execution. For this reason, a significant percentage of our defense resources is allocated to meeting our manpower requirements. As our resources are limited, however, we must make the most efficient and effective use of the men and women who constitute the "Total Force."

2. The Total Force

Our Total Force comprises the organizations, units, and personnel that constitute the Defense Department's manpower resources. These resources include active and reserve military personnel, military retirees, DoD civilian personnel, contractor support, foreign national civilians, and host-nation support. Total Force composition is shown in Chart II.C.1.

The Total Force must be structured to respond effectively to a variety of contingencies, including peacetime operations, low-intensity conflicts, and large-scale conflagrations. We must state the requirement, measure the resources available for meeting the objective, and base our decisions upon the most cost-effective mix of our manpower and equipment resources. This is a complex process requiring sophisticated tools and procedures for identifying requirements, measuring resources, and then determining the alternative that provides the best mix.

The Congress has directed the Defense Department to strengthen these current practices and procedures for allocating manpower resources. In response, we have drafted a Total Force policy which more clearly articulates the principles, policies, and evaluation criteria governing the Total Force composition in the all-volunteer era. The following sections address the major aspects of this policy.

a. The Volunteer Force Concept versus Conscription

In spite of recent recruiting successes, debate persists over the desirability of returning to some form of conscription or national service to meet future military

Composition of the Total Force*

Chart II.C.1

Foreign National Civilian 2.1%
Host-Nation Support 1.6%
U.S. Civilian 16.1%
Standby Reserve 0.7%
Individual Ready Reserve 8.5%
Retired Military 13.9%
Active 37.0%
Selected Reserve 20.2%

4.7 Million Military Personnel
1.1 Million Civilian Personnel

*Percentages do not add to 100 percent due to rounding.
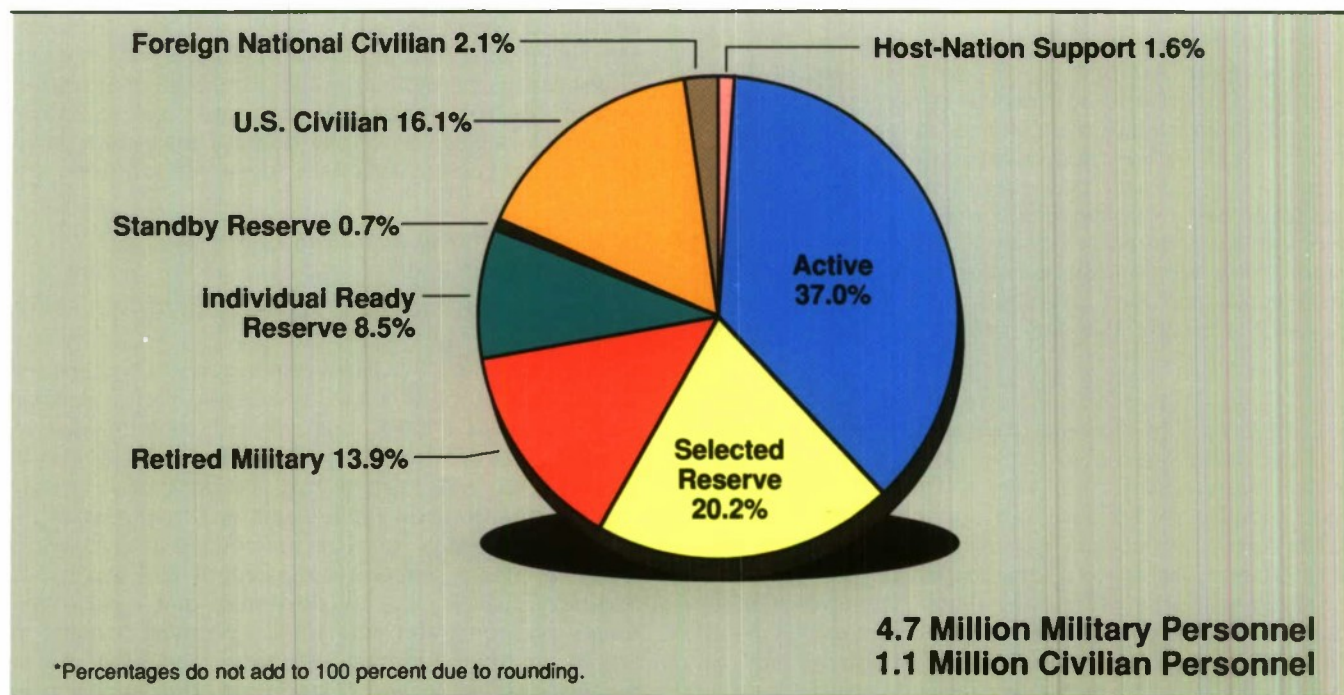
manpower requirements. There are several compelling reasons to retain the current volunteer system. First, various incentives and improved recruiting techniques have been successful in attracting higher-quality individuals in spite of a decreasing manpower pool. If pay standards are maintained, this trend is expected to continue. Second, conscription is more expensive when training requirements are factored in. Compulsory two-year enlistments would expand basic training requirements and would reduce unit cohesiveness and proficiency. A national service program would present many of the same problems as a draft. The volunteer system works, and there is no clear benefit in turning to an alternative to satisfy military work force requirements.

b. Active Component Military Manpower

(1) Active Component Military End Strength

Congress authorized 2,137,300 active duty manpower positions for DoD for FY 1989. Our request for total military end strength for FY 1990 is 2,138,200, and for FY 1991 is 2,134,600.

(2) Manpower Requirements

(a) Officer Requirements

Since the enactment of the Department of Defense Authorization Act of FY 1987, we have been working with the Congress to address our officer requirements. A study submitted to the Congress in March 1988 identified 7,733 officer authorizations that were insufficiently justified and made recommendations that are currently being implemented by the Services. By 1990, we will have eliminated over 10,000 officer positions since 1986. We continue to monitor closely officer requirements and have instituted more rigorous internal reviews to ensure that any future growth is well-justified.

As a result of the experience gained from this issue, we also have intensified our review process for manpower requirements. We have collected the authorization files for all Services into a common data base to allow cross-Service analysis of manpower utilization. Combined with a significant expansion of my staff charged with the manpower requirements oversight, this increased emphasis on the review process will result in an enhanced ability to identify officer as well as enlisted and civilian manpower resource needs.

(b) Recruiting / The Montgomery GI Bill

During this administration, the Congress and the Services have worked together to reverse the negative trend that in the 1970s led to inadequate compensation, enlistment incentives, and recruiting resources. Such conditions made it very difficult to attract quality people into our Armed Forces. Since that time, military compensation has become more competitive, quality-of-life programs have been enhanced, and the Services have received adequate levels of recruiting and advertising resources.

In addition, in 1987 Congress passed the Montgomery GI Bill that provides $10,800 for post-high school education to any high school graduate who contributes $1200 and enlists for at least three years of active duty ($9,000 for a two-year active duty tour). Supplements of up to $14,400 are allowed for individuals who enlist into critical, hard-to-fill skills. The benefits have proven to be very popular and effective -- almost 80 percent of our eligible recruits enrolled in the program in FY 1988. The Bill also offers significant benefits to those enlisting in the Reserve forces and has proven to be a significant recruiting incentive.

These pay, quality-of-life, and educational initiatives have helped the Services recruit high-quality young men and women, individuals with high school diplomas and high enlistment test scores. Table II.C.1 depicts the number and quality of enlisted accessions for FY 1988 and planned recruitment levels through FY 1990. Although the Services met or exceeded their enlistment objectives in FY 1988, a stronger economy and shrinking youth pool have made the recruiting environment more difficult. With continued congressional support for personnel programs and recruiting incentives, we can meet our military manpower needs with quality volunteers for the foreseeable future.

(3) Personnel Management

(a) Enlisted Issues / Seniority Mix

Current overall retention rates and average longevity are indicators of a quality enlisted force. Between FY 1980 and FY 1988, our enlisted retention rate increased from 80.7 to 83.1 percent, and years of service from 5.55 to 5.99 years during the same period. Basic military compensation and funding for quality-of-life programs, however, must be maintained at competitive levels to ensure proper force strength and quality. In addition, full funding of enlistment and reenlistment bonus programs and education incentives remains essential to our continued success in retaining the required number of highly trained and experienced

Quality and Numbers of Enlisted Active Duty Accessions [a]
(Numbers in Thousands)

Table II.C.1

	Quality Indices 1988		Accessions		
	Percent High School Graduates	Percent Average or Above Aptitude	FY 1988	FY 1989[b] Planned	FY 1990[b] Planned
Army	92.7	95.6	115.4	128.1	132.6
Navy	90.6	90.5	93.9	94.8	93.2
Marine Corps	94.3	90.0	36.0	37.8	31.1
Air Force	99.1	99.9	41.5	47.5	57.8
Total	**93.2**	**95.0**	**Total 286.8**	**308.2**	**314.7**

[a] Includes prior service and nonprior service accessions.
[b] Estimates.

personnel in shortage specialties and mission-critical technical skills.

A visible, clearly defined and predictable promotion pattern is an essential element of any effort to encourage retention. The Department is revitalizing its efforts to define a seniority mix that enables the enlisted man or woman to plan a career progression. The mix seeks to establish required percentages of grade and experience so that changes in the size of the force will not interrupt promotion patterns. The goal is to align the force structuring and personnel management processes and then to enable this alignment through a consistency in funding.

(b) Officer Issues

We now have a quality officer corps. There are, however, concerns about the retention of three groups that possess highly marketable skills: pilots, nuclear-trained naval officers, and health services officers.

1. Pilot Retention

The exodus of pilots to commercial aviation continues at unprecedented rates, with 5,428 new commercial hires in the first six months of FY 1988 and 4,000-7,000 projected annually well into the 1990s. Our tactical air forces are currently losing more than one experienced fighter pilot per day, each representing a full replacement cost of more than $2.5 million. The situation could reach crisis proportions if stronger measures are not taken soon to improve retention. If current trends continue, the Air Force predicts a 2,500 pilot shortage in FY 1993. The new aviator bonus -- Aviator Continuation Pay (ACP) -- authorized by the Congress for FY 1989, should cut this shortage in half, but will not alone solve the problem. A comprehensive report is currently before the Congress that explores other monetary as well as non-monetary management initiatives to remedy the problem. Enactment of the proposed legislation is crucial to our aviator retention program.

2. Nuclear-Trained Officers

The Navy has a significant (28 percent) shortfall in nuclear-trained submarine officers in grades lieutenant commander through captain (04-06); and to a lesser extent, a shortfall in nuclear-trained surface warfare officers in the grades of lieutenant (03) and lieutenant commander (04). With strong congressional support, however, the Navy is working to reduce this shortfall. Specifically, the enhanced nuclear officer incentive pay and the 35 percent increase in submarine pay in the FY 1988 Defense Authorization Act are definite factors in improving nuclear-trained officer retention.

3. Health Services Officers

We continue to face serious problems in attracting and retaining many essential health care personnel, primarily physicians and nurses. Retention of military physicians has been declining over the past several years, and specialty payments for physicians have been developed to reverse this trend. For the first time, the Services are experiencing difficulty in attracting registered nurses. This mirrors the nation's shortage and may require additional incentives to attract qualified nurses to the military. In FY 1989, we are providing a report to the Congress with recommendations on legislation that would help alleviate these medical recruiting and retention problems. Enactment of such proposals will be essential to preserving the quality and responsiveness of the Military Health Services System.

4. Joint Officer Personnel Policy

Passage of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 represented the most extensive legislation concerning joint officer personnel management in history and posed the most complex implementation requirements since the Defense Officer Personnel Management Act of 1980. During the past year, the Department has made significant progress in implementing the provisions of Title IV (Joint Officer Personnel Policy) of the Act.

The Department has continued to devote considerable effort to the identification of the appropriate policies and procedures necessary to effect the provisions of the Act. Pending publication of a formal directive, additional policy memoranda have been issued concerning the following areas of joint officer personnel management: identification of scientific and technical categories, procedures for selecting joint specialty officers, designation of critical occupational specialties, and criteria for dual-hat and cross-Department joint duty assignments. A list containing approximately 8,360 joint duty assignments has been published, including 1,020 critical joint duty assignments to be filled by officers who have been awarded the joint specialty. The Department, in conjunction with the Joint Staff, is close to full implementation of a joint duty assignment management information system. This system will be the key to managing the joint duty assignment list and implementing the extensive career oversight and reporting requirements entailed in the Act. Finally, extensive reviews of joint professional military education have been conducted. These, in conjunction with the results of the Skelton Panel, have allowed us to map a proposed strategy for joint professional military education which is being finalized by the Joint Staff and on which major decisions will be made in the near future.

The recently enacted FY 1989 DoD Authorization Act contained important amendments to the joint officer management portion of the DoD Reorganization Act of 1986 needed by the Department to make its effective implementation possible. The focus of current efforts will be on establishing policies and procedures that will institutionalize these changes and foster full compliance with the spirit and intent of the statute.

The Act requires the Department to report to the Congress certain statistical measures and personnel actions accomplished in the area of joint officer management for each fiscal year. A detailed report on the implementation of this Act will be provided under separate cover.

(c) Women in the Military

Today, more than 221,000 officer and enlisted women constitute over 10 percent of the active duty force. During FY 1988, DoD implemented multiple recommendations of the Task Force on Women in the Military, expanding and enhancing career opportunities and development for women. In keeping with the policy that women will be used in all roles except those explicitly prohibited by the law, and interpreting the law to allow as many career opportunities as possible to be kept open, DoD adopted the "risk rule." The risk rule states that *noncombat* units should be open to women unless the risk of exposure to direct combat, hostile fire, or capture is equal to or greater than that experienced by associated *combat* units in the same theaters of operation. The Secretaries of the Military Departments reviewed and evaluated their Services' noncombat support units and positions closed to women in light of the risk rule and opened more than 24,000 additional positions to women. Additionally, the Department implemented Task Force recommendations which targeted the elimination of sexual harassment through effective leadership (top-down approach), improved education and training, and establishment of workable complaint systems that are responsive to the complainant.

(d) Training: Optempo and Readiness

Training has improved markedly during the 1980s because of better quality personnel, the development of greatly improved ranges and training methods, and maintenance of adequate operating tempo (Optempo) -- flying hours, steaming days, and ground vehicle miles. Recognizing the need to better justify Optempo levels, we are engaged in a comprehensive research program to develop linkages between the various aspects of Optempo and unit performance, and preliminary results indicate a positive correlation. This is a complex problem, however, and we foresee that expert military

judgment will remain a key determinant of the adequacy of Optempo.

(4) Military Compensation

The Department has been concerned that pay raise caps, together with cutbacks in such important benefit programs as retirement and Morale, Welfare, and Recreation (MWR) activities, will seriously damage our ability to recruit and retain quality manpower. In FY 1989, therefore, we made a 4.3 percent pay raise for military members one of our highest priorities and are pleased that the Congress supported us.

This raise ended a consecutive six-year trend in which the military pay raise was less than civilian wage growth, producing a cumulative gap of 11 percent. The FY 1989 raise narrowed the gap to 10.1 percent, as shown in Chart II.C.2. We remain committed to closing the gap completely over the long run and, to that end, had originally budgeted a 4.6 percent raise in FY 1990 that exceeds projected private sector wage growth of 4.2 percent. However, because of budget deficit considerations, we have lowered the request to 3.6 percent. While this increase is less than we would have preferred, it generally matches inflation and is not significantly below private sector wage growth.

Adequate housing and housing allowances also greatly influence retention of military members. One of DoD's concerns in this area is the continuing limitations on the Variable Housing Allowance (VHA). We have, therefore, requested a VHA increase in FY 1990 to match housing cost growth. At the same time, we are conducting a review of military housing and housing allowances at the request of the Congress and will submit legislation next year to make appropriate changes.

(5) Quality of Life, Families, and Support

(a) Quality-of-Life Programs

DoD members and their families constitute the most important resource supporting our national defense. Their quality of life should reflect the high standards and pride of the American people they defend. We are committed to creating an environment that fosters healthy family interaction and to assisting the family to meet the challenges of the mobile military life style. Key quality-of-life programs include: dependent education, child care, family member employment support, medical and dental care, religious support, relocation assistance, family housing, housing allowances, housing for unaccompanied service mem-

Wage Growth
(FY 1981 - 89)

Chart II.C.2
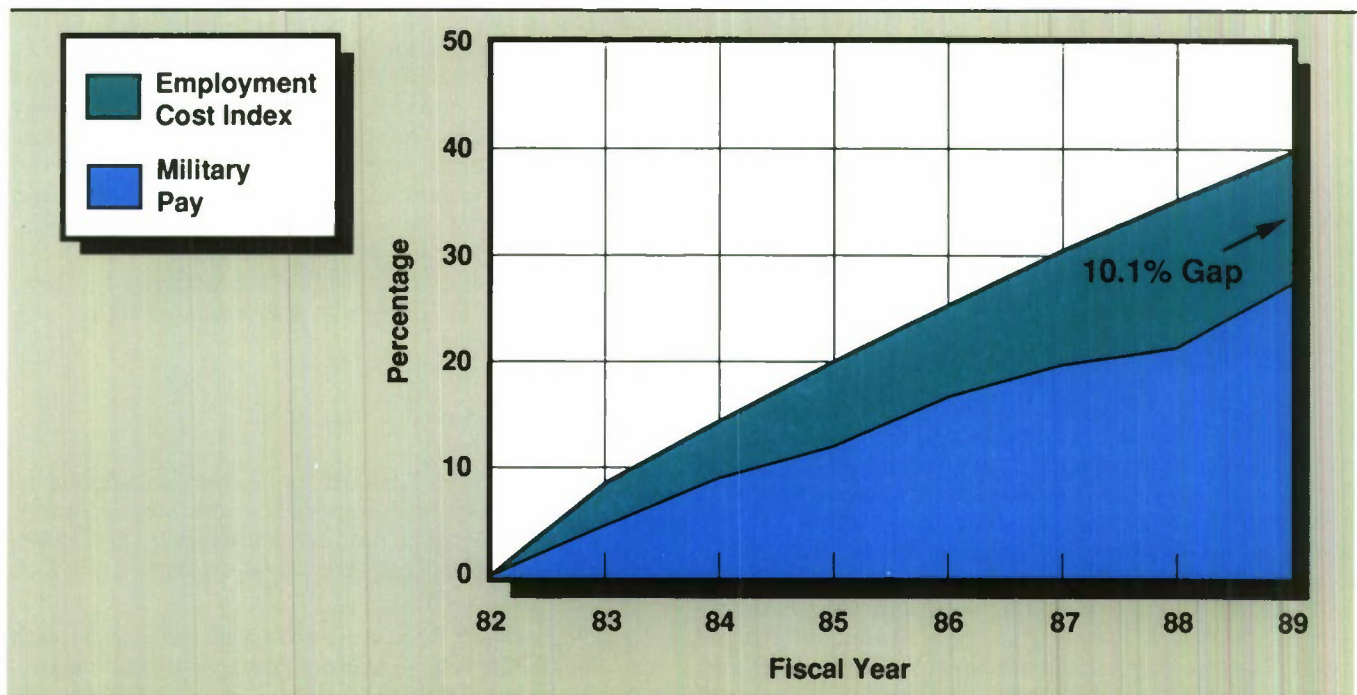
bers, family support centers, commissaries, and MWR activities.

(b) Dependent Education

The Department of Defense Dependents Schools (DoDDS) serve over 153,000 dependents in 273 schools. In the past year, DoDDS have increased parental involvement in the schools by including parents on interview panels for district superintendents, and by creating representative groups of parents at all school management levels.

(c) Child Care

While we are currently serving more than 80,000 children in 639 military child-care centers worldwide, we estimate that we have an additional 81,000 children that require accommodation. Expanding the number of on-base family day-care centers has met a little over half of this requirement, but it is essential that the Congress appropriate the funds required to support our child care initiatives. These initiatives will require an increase in annual appropriations from the current $43 million per year to between $80 and $90 million per year, over the next four to five years.

(d) Morale, Welfare, and Recreation (MWR) Programs

DoD made a complete policy reassessment of the MWR program. Our report to the Congress recommended restructuring MWR funding categories in the fall of 1987 and capping future appropriated fund support for operational expenses. Our reforms in MWR management address congressional concerns and should facilitate adequate funding of these programs. We now need stability over the next several years to assess and evaluate our initiatives and adjust where necessary.

(e) Family Advocacy Programs

The Family Advocacy Program addresses the prevention, identification, treatment, and reporting of family violence. Child sexual abuse in out-of-home care settings has emerged as an issue requiring special attention. To address this concern, the Services have modified hiring practices and staff procedures at child-care centers. We have also developed a training manual and established a Family Advocacy Command Assistance Team to provide on-site consultation in cases of institutional child sexual abuse.

(f) Safety and Occupational Health

Our comprehensive safety and occupational health program saves personnel resources, thereby increasing defense readiness. Recent major initiatives include the training of DoD military and civilian personnel on potential workplace chemical hazards and establishing a system to respond effectively to accidents involving the shipment of DoD-owned explosives or munitions.

c. Reserve Component Military Manpower

Under the Total Force policy, our national security interests are increasingly based on our ability to mobilize, deploy, and employ National Guard and Reserve forces rapidly along with Active forces. With the advent of the All-Volunteer Force in 1973 and the steady increases in Reserve strengths since 1980, our reliance on the Guard and Reserve has increased dramatically. Since FY 1980, the National Guard and Reserve have grown by approximately 300,000 through FY 1988, an increase of 36 percent. The Reserve Components represent 65 percent of the Army's medical units, 88 percent of the Navy's minesweepers, two-thirds of Air Force tactical airlift, and one-fourth of the Marine Corps' combat divisions. Table 2 of Appendix B displays the growth in Reserve Component manpower strength relative to the Active Component.

Several significant events involving our Reserve Forces occurred during FY 1988. These included a "no-notice" exercise of the President's statutory authority to order up to 200,000 members of the Selected Reserve to active duty; release of data from the most extensive surveys of Reserve Component members and their families ever taken; an assessment of the first successful screening of the Individual Ready Reserve (IRR); and the completion of the presidentially directed Sixth Quadrennial Review of Military Compensation (6th QRMC). These events, which are addressed below, highlight efforts to improve the readiness of the Reserve Components.

(1) Reserve Categories

All Reserve and Guard manpower is assigned to one of three Reserve Component manpower categories -- the Ready Reserve, the Standby Reserve, or the Retired Reserve. The Ready Reserve includes:

• The Selected Reserve -- units and individuals with the highest reserve priority requirement for personnel, training, and equipment;

- The Individual Ready Reserve -- a pool of trained manpower to serve as augmentees and replacements for active and reserve units;

- The Inactive National Guard -- individuals who do not participate in training, but are attached to a specific National Guard unit for mobilization.

The Standby Reserve is a pool of trained individuals who maintain their affiliation with the Reserves, but who are not required to participate in training or serve in units. The Retired Reserve contains reservists who were transferred to a retired status in accordance with law or directive, and who may be ordered to active duty in time of emergency.

(a) Selected Reserve

The expanded scope, size, and nature of the missions assigned to the Reserve Components require that units of the Selected Reserve, especially early-deploying units, be manned at levels that make them ready for combat on short notice. To meet these demands, Selected Reserve strength increased by 7,500 in FY 1988 to an all-time high of 1,158,357. Our FY 1989 end strengths reflect a growth of approximately 12,000 above FY 1988 levels, and end-strength growth between FY 1988 and FY 1990 is projected to total about 20,000 for all Reserve Components.

1. Exercise of the President's 200,000 Call-up

A test of the availability of those members of the Selected Reserve who could be ordered to active duty by the President without declaration of a national emergency was performed in conjunction with JCS Exercise PROUD SCOUT. As expected, nearly 94 percent of the members of those units selected at random were contacted within the test's 72-hour time period; over 92 percent reported to their Reserve Center or Armory or were excused pursuant to standards set by their respective Services.

2. Selected Reserve Enlistments

Selected Reserve enlistment objectives and accessions are listed in Table II.C.2. Between FY 1980 and FY 1988, Selected Reserve end strength increased by nearly 36 percent. As with the active force, the quantity and quality of reserve enlistments to meet strength increases have remained high. Eighty-five percent of all FY 1988 enlisted, non prior service accessions were high school graduates, and 86 percent scored average or above in the Armed Forces Qualification Test.

Selected Reserve Enlistments
(Numbers in Thousands)

Table II.C.2

	FY 1988 Objectives	FY 1988 Achieved	FY 1989 Objectives	FY 1990 Objectives
Army National Guard	78.7	75.6	80.1	79.0
Army Reserve	77.6	76.0	80.8	77.0
Naval Reserve	34.2	30.1	32.8	32.8
Marine Corps Reserve	13.2	12.7	13.2	13.2
Air National Guard	12.7	11.2	11.8	12.1
Air Force Reserve	13.8	13.3	14.3	14.2
Total	**230.2**	**219.0**	**233.0**	**228.3**

3. Full-Time Support Personnel

The full-time support program is the backbone of Selected Reserve Component unit readiness. It includes Active Component personnel, Active Guard and Reserve personnel, military technicians, and civil service personnel, who assist in the day-to-day organizing, administering, recruiting and retaining, instructing, and training of the Reserve Components, as well as in equipment maintenance and other logistical support. The total full-time support strength at the end of FY 1988 was nearly 15 percent of the Selected Reserve (see Table II.C.3).

4. Reserve Component Surveys

These surveys of perceptions and attitudes were the most comprehensive and accurate ever conducted on members of the Selected Reserve and their spouses. The positive response rates (59.7 percent for enlisted and 76.1 percent for officers) and the response numbers (52,000 enlisted, 12,000 officers, and 33,000 spouses) ensure a high degree of accuracy. These data have already been used extensively by the Department, and will provide the basis for analyzing personnel policies and initiatives.

(b) Individual Ready Reserve (IRR) / Inactive National Guard (ING)

The IRR is a major source of pretrained individual manpower during the critical early stages of a mobilization or war. It has increased by almost 20 percent since FY 1980 (see Table II.C.4) and is projected to reach 693,000 members in FY 1991 as a direct result of the increase in the military service obligation from six to eight years. Annual screening of IRR members mentioned in last year's defense report continued in FY 1988, with 96,335 members reporting for one day of active duty. The IRR Screening Program has resulted in reinforcement of members' legal obligation, improvements in the accuracy of the IRR data base, and recruitments to the Selected Reserve.

(c) Retired Reserve

It is our policy to use both Regular and Reserve Force retirees to meet the demands of mobilization or other emergencies. Military retirees who have completed at least 20 years active service may be ordered to active duty at any time. Any other retired member of a Reserve Component may be ordered to active duty upon declaration of war or national emergency. Table

Full-Time Support Personnel *
(End Strength in Thousands)

Table II.C.3

	Actual		Planned		
	FY 1980	FY 1988	FY 1989	FY 1990	FY 1991
Army National Guard	33	55	55	56	56
Army Reserve	17	28	27	29	29
Naval Reserve	20	32	32	33	33
Marine Corps Reserve	5	7	7	8	8
Air National Guard	26	34	34	35	35
Air Force Reserve	11	16	16	16	16
Total	**112**	**172**	**171**	**177**	**177**
Percent of Selected Reserve	12.9	14.8	14.6	15.0	15.0

* Includes Active Guard and Reserve (AGR), Military Technicians (MT), Active Component (AC), and Civil Service (CS) personnel.

Individual Ready Reserve/Inactive National Guard
(End Strength in Thousands)

Table II.C.4

	Actual		Planned		
	FY 1980	FY 1988	FY 1989	FY 1990	FY 1991
Army National Guard [a]	7	9	11	11	11
Army Reserve	199	293	295	328	429
Naval Reserve	97	84	90	113	135
Marine Corps Reserve	57	42	49	54	74
Air Force Reserve	45	55	44	44	44
Total [b]	405	484	473	550	693

[a] Inactive National Guard.
[b] Numbers may not add due to rounding.

Military Retirees
(End Strength in Thousands)*

Table II.C.5

	FY 1988				
	Army	Navy	USMC	USAF	DoD Total
Under Age 60 & Non-Disabled:	237	205	40	332	814
Over Age 60 or Disabled:	336	265	50	243	894
Potentially Available for Mobilization:	572	470	90	575	1,708

*Numbers may not add due to rounding.

II.C.5 depicts the number of retirees that are potentially available for mobilization.

(2) Sixth Quadrennial Review of Military Compensation (6th QRMC)

At the expressed interest of the President, the 6th QRMC focused its review exclusively on Reserve Component compensation issues. Special emphasis was placed on compensation in support of personnel readiness, including the effectiveness and adequacy of existing incentives. The final report stated that fundamental restructuring of the compensation system is not warranted; however, the 6th QRMC did conclude that the reserve retirement system should be revised. The QRMC produced a complex set of conclusions and recommendations and endorsed legislation on: basic pay and allowances, incentive programs, civilian employment and mobilization, health care, full-time support, medical manpower, and other reserve compensation issues.

d. Civilian Manpower

(1) Contribution to the Total Force

Our policy is to employ civilian employees and contractors wherever possible to free our military forces to perform military functions. This policy also provides stability and continuity to offices and organizations when uniformed personnel are rotated.

Civilians constitute approximately one-third of our active manpower, and they participate in all noncombat defense activities. In addition to their traditional support roles, in recent years civilians have also increased their involvement in the maintenance, repair, programming and, in some instances, the operation of offensive, defensive, and strategic control and surveillance forces. Civilian retirees are also a potential wartime resource. Our research indicates that as many as 75 percent would voluntarily return to serve.

(2) Size of the Civilian Work Force

Our employment figures are based on a manpower requirements determination that is designed to meet our needs at the lowest possible cost while maintaining the highest level of efficiency. In FY 1990, we plan to employ about 1,104,000 civilians. Of this number, 1,019,000 are direct hires (U.S. citizens and foreign nationals employed directly by the Defense Department) and 85,000 are indirect hires (foreign nationals paid by their own government, with reimbursement of the government by the United States).

Civilian employment will decrease from the FY 1989 level by four tenths of one percent. In 1990, as throughout the 1980s, civilians will comprise approximately 25 percent of our total defense manpower, including Reserve Component manpower.

(3) Management Issues

The FY 1986 through FY 1989 appropriations acts reversed previous policy and directed us to manage the authorized defense program with no civilian end-strength ceilings. This positive initiative enables us to employ civilians based on mission requirements and funded workload, and we look forward to congressional assistance in eliminating overseas workyear ceilings.

In FY 1988 we met the manpower reductions required in the Goldwater-Nichols DoD Reorganization Act of 1986. The reductions for FY 1989 have been accommodated within the total DoD reductions agreed to at the budget summit.

While the Congress, the military Services and the administration have worked to overcome the extremely unfavorable military manpower conditions of the late 1970s, corresponding problems in the Department's civilian work force have not been solved. We are deeply concerned about the overall civil service personnel system and our ability to recruit and retain professional and technical civilians. In my report to the Congress last year, we indicated our need to hire and retain highly skilled, capable performers and noted the decline in our more senior, experienced employees. At the request of the Congress, we also conducted a review of 36 health care professional occupations in which we have experienced inadequate compensation and significant shortages of applicants. These factors, if they remain unchecked, will have profound consequences on the future of this Department. Likewise, both the Packard Commission and the Defense Science Board have expressed concern over the problems they found in our recruiting and retention and in our ability to provide incentives for high-quality scientific, engineering, and acquisition personnel. In response to these concerns, we have undertaken a high-level, comprehensive study of DoD professional and technical manpower requirements and the means to ensure adequate manning.

Since then, we have worked closely with the Office of Personnel Management and the Congress in support of legislation that will allow us to test personnel systems that are less reliant on rigid classification distinctions and more reliant on pay flexibility that is more closely linked to performance. Senate Bill S. 2530, which was introduced in the last Congress, gives us the opportunity to develop a personnel system for the 21st century. In addition, the compensation of civilian lead-

ership positions must be changed. In this regard, it is essential that the Congress support the President's recommendations stemming from the 1988 report of the Quadrennial Commission on Executive, Legislative, and Judicial Salaries.

(4) Personnel Program Initiatives

DoD is pursuing numerous management initiatives. The Army has chartered the Civilian Personnel Modernization Project (CPMP). This project focuses on current Army policy toward the civilian work force and seeks to design and implement a personnel system which strengthens the leadership of the civilian members of the Army team, places greater authority for personnel management in the hands of managers and supervisors, and streamlines the management process.

The Navy has developed an innovative Alternative Performance Appraisal System (APAS) that is a streamlined approach to the development of performance elements and standards. APAS saves time and paperwork by providing preestablished generic elements and standards that remain in place from year to year.

The Air Force has published PALACE AGENDA, a strategic plan which aims to create more competitive pay systems, a simplified personnel system, and a greater institutional identity for civilians. Under AGENDA, the Air Force is developing a market-sensitive pay system (PALACE MARKET), expanding a management-to-budget system (PALACE COMPETE), testing corporate appraisal and gainsharing ideas (PACER SHARE), and automating personnel documents and processes.

Project EXPO, a three-year experiment under OSD sponsorship conducted in the military departments and the Defense Logistics Agency, focuses on methods for increasing personnel office productivity and improving the delivery of personnel services to management and employees.

3. Military Health Care

a. Introduction

The primary responsibility of our health care system is to be ready to meet all wartime requirements for life-saving care. At the beginning of this administration we made a deliberate decision to focus our efforts on improving medical readiness. This decision has paid off. Our medical structure today has more modern equipment and better health provider, recruiting, and training programs. Our annual military medical budget of over $12 billion operates a system of 168 military hospitals and over 800 medical and dental clinics worldwide to support our troops and our other beneficiaries.

b. Medical Readiness

Our progress in medical readiness is evidenced by these improvements:

- The Deployable Medical Systems (DEPMEDS) program has become operational. DEPMEDS is a building block system of functional medical modules that can be configured for use in the most forward areas of the combat zone to the rear edges of a theater of operations. DEPMEDS enables all Services to use the same medical equipment, thereby improving medical support for combat operations. Prior to 1982, there were no standardized deployable medical systems. Today, 143 DEPMEDS hospitals have been funded (40 are on hand, 103 are on order). Continuing this critical program, we are requesting funding for 21 DEPMEDS in the FY 1990-91 budget.

- During this administration, two hospital ships, the USNS Mercy and the USNS Comfort, entered the United States Navy inventory. Both ships, now in a reduced operating status, constitute a rapid medical response asset providing 2,000 beds and 24 operating rooms afloat.

- Our emphasis on readiness has succeeded in redirecting growth in personnel programs toward reducing critical wartime shortages. Today, there are more than 100 additional physician specialists holding the most critically short wartime specialties in the active forces (an 11 percent increase), and nearly 1,700 additional military nurses (a 15 percent increase).

- The Combat Casualty Care Course, established under the Army in 1982, evolved into a DoD-wide program in 1986 as the Joint Medical Training Center. Prior to this time there was no adequate formal DoD training program to provide realistic combat medical training. Subsequently, exportable training tailored to the Reserve Component training environment has been developed. Beginning in FY 1989, we will train more than 400 additional active duty providers and 6,000 additional reservists annually.

- We have taken vigorous steps to improve theater medical readiness. Following a 1984 review of our medical posture in Europe, a full-time, general officer European Command surgeon was authorized and assigned; medical teams capable of responding to terrorist threats were designated, exercised and

employed; and a single medical logistics manager was designated.

- Since 1982, we have improved relations with foreign countries through the international community of military medicine. We have negotiated and signed military medical cooperation agreements with Israel, Jordan, Tunisia, and France.

- The Civilian Military Contingency Hospital System has doubled its goal of 50,000 contracted civilian hospital beds for the care of military casualties. In 1984, we joined with other agencies to form the National Disaster Medical System (NDMS). NDMS now has over 100,000 hospital beds contracted by over 1,000 hospitals in 72 metropolitan centers throughout the United States. The hospitals are capable of managing casualties from overseas conflicts or domestic disasters.

c. Quality of Care

Over the past eight years, the Department has achieved unprecedented goals in developing and implementing quality assurance programs.

- We have required that health care professionals have a current, valid license to practice. Our guidance provides a clear and specific policy on the clinical training, education, and experience required before clinical privileges are granted.

- Our External Peer Review program reviews the health care provided in all DoD treatment facilities. Recent findings on over 400,000 selected inpatient admissions indicate that one-tenth of one percent of the care screened fell short of the peer review standards, putting the military medical system ahead of the civilian sector in this regard.

- We have developed, tested, and adopted a method for abstracting and analyzing malpractice claims. Although there has been a continuing industry-wide increase in the amount paid in malpractice cases over the past decade, there has been a declining trend in the number of DoD malpractice claims submitted each year since 1985.

d. Health Promotion

Supporting health awareness and encouraging a healthy lifestyle for our beneficiaries is an important part of ensuring the medical readiness of our troops and reducing disease in the military family.

Our health promotion goals include decreasing alcohol abuse and promoting smoking cessation. Alcohol consumption, especially heavy drinking, has dropped significantly in recent years. Self-reported loss of productivity due to alcohol use has also decreased dramatically. We have had an increase in the percentage of nonsmokers and a decrease in the percentage of heavy smokers, indicating that our anti-smoking campaign, begun in late 1985, is beginning to show success.

e. Human Immunodeficiency Virus (HIV-1) Infection

The AIDS (HIV-1) epidemic poses unique problems for our military health care system. Our AIDS policy includes screening active duty and Reserve Component personnel. Active duty personnel confirmed to have evidence of infection receive extensive evaluation, psychological support, and treatment if necessary. They are restricted from overseas assignments but are medically separated or retired only if they are not medically fit for duty. Potential recruits testing positive for HIV-1 infection are prohibited from appointment or enlistment in the military Services.

f. Our Partnership with Civilian Health Care Providers

During this administration, we have taken a new and innovative look at our responsibility to provide medical care to families of active duty members and to retiree families under the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). With annual CHAMPUS costs now exceeding $2.5 billion, we have established a more beneficial working relationship with the civilian health care sector that comprises the following elements:

- CHAMPUS has adopted a more cost-effective reimbursement system: the Diagnosis Related Group (DRG) payment method. Implemented just a year ago, the DRG method means that CHAMPUS will no longer pay whatever a provider chooses to charge.

- Our fiscal intermediary Preferred Provider Organization (PPO) demonstration project in Florida and Georgia will offer health care services at reduced cost to both beneficiaries and the government. Under the PPO arrangement a network of civilian health care providers will agree to reduce their usual charges in return for being recommended to military families. We intend to expand upon this promising new program in the next fiscal year.

- CHAMPUS is implementing a Peer Review Organization program throughout the United States. For the first time, CHAMPUS will have an independent monitor of the quality and appropriateness of

health care services provided to beneficiaries by civilians.

- The Military-Civilian Health Services Partnership Program is addressing the medical staff shortage problem by supplementing military hospital staff with civilian providers. Close to 300 agreements in over 80 military facilities have been signed and implemented to serve previously met demands at less than the standard CHAMPUS cost.

- The CHAMPUS Reform Initiative demonstration project in California and Hawaii is another ambitious new program. Through a large regional contract with a group of private firms, this project seeks to accomplish better management of health care delivery, and more effective use of military hospitals.

g. Medical Construction Program

The integration of the Services' medical construction programs into a single program managed by the Defense Medical Facilities Office has focused our most urgent requirements.

Our FY 1990-91 budget requests funds for a number of projects critical to our ability to preposition our contingency hospitals and to provide frozen blood storage. It also addresses serious facility problems in our hospitals at several overseas locations. We are asking for funds to upgrade our U.S. medical centers at Fort Lewis, Washington; San Antonio, Texas; and Portsmouth, Virginia. These centers are vital training sites and produce many of our physicians.

h. Stewardship and Strengthening Management

During this administration, we have sought to improve overall medical readiness and service to our beneficiaries, and to strengthen management to preserve improvements and control costs. The health care arena shares this concern and has addressed management issues in innovative ways.

- To focus and direct future automation initiatives and to maximize systems standardization and integration throughout the Military Health Service System (MHSS), a comprehensive and long-range MHSS Information Systems Architecture has been developed by the Defense Medical Systems Support Center.

- Substantial progress was made this year in the Department's program to automate critical functions within medical treatment facilities. The Composite

Health Care System is being installed in ten military hospitals for extensive testing and evaluation during FY 1988-89. We will commence full distribution in FY 1990.

- To promote the most effective use of all available health care resources, we are carefully evaluating joint Service efforts for sharing facilities, personnel, supplies, and equipment to provide a command and control structure that will enhance military health care and strengthen the graduate medical education and readiness programs. Thus far, three joint area systems have been established in San Antonio, Texas, the Delaware Valley, and the San Francisco Bay area.

4. Anti-Drug Programs

a. Introduction

One of our most notable accomplishments has been our success in confronting drug abuse. Our contributions have been significant, both within the Department and in support of law enforcement's efforts in the broader American community.

b. Drug-Free Workplace

We are implementing programs to ensure that our workplaces are drug-free. To meet this goal, a new DoD directive was issued on August 23, 1988 requiring each of the Services, Defense agencies, and other independent activities to implement a program of urinalysis testing, employee and supervisory education, and employee counseling. All our component plans have been approved by the Department of Justice, and implementation is expected by early 1989. We also intend to implement a policy requiring our contractors to assure that their workplaces are drug-free.

c. Increased Public Awareness and Prevention

Military recruiters continue to bring a strong anti-drug message to the hundreds of thousands of young Americans with whom they come into contact each year. Within all segments of the Defense community, prevention and education efforts continue at a high pace. A special, intensive prevention and public awareness effort was developed in support of the Administration's National Drug-Free America Week in October. A pilot program in DoDDS, based on the model developed in Los Angeles, has been so successful that we have implemented it throughout our European school system during school year 1988-89. Project D.A.R.E. -- Drug Abuse Resistance Education -- is

taught in our fifth and sixth grades by specially trained military police officers. Youngsters develop the skills and insight necessary to avoid falling victim to drug abuse.

d. Strengthened Law Enforcement

We provided significant assistance to law enforcement drug interdiction efforts in FY 1988, despite substantial budgetary reductions. In excess of 28,000 hours of surveillance support were flown, over 2,000 ship days were provided by the Navy to the Coast Guard's Law Enforcement Detachment (LEDET) program, and we currently have a significant amount of equipment on loan to law enforcement agencies. During FY 1988 we examined various new radar systems that, as a by-product of military requirements, have substantial potential application for detecting aerial and maritime drug smugglers. These include the Navy's Relocatable Over-the-Horizon Radar (ROTHR) and the Air Force's Over-the-Horizon Backscatter (OTHB) radar. During their ongoing test and evaluation, ROTHR and OTHB are supporting detection requirements of the Customs Service and Coast Guard.

For FY 1989, the Department will move aggressively to meet its new statutory requirements as lead agency for detection and monitoring of air and sea drug traffic across our borders; integrate the command, control, communication, and technical intelligence assets dedicated to drug interdiction into an effective communications network; and enhance state governors' use of the National Guard in support of drug interdiction. We remain committed to the appropriate use of DoD resources in support of the crusade against drug abuse, consistent with our national security responsibliities.

e. Improved International Cooperation

Drug producer, processing, and transshipment countries continue to experience mounting internal pressure from the harmful effects of drug trafficking. Under the authority of the Department of State we are pleased to continue our program of support to nations requesting our aid. An Army UH-60A Blackhawk helicopter detachment is deployed to the Bahamas to transport Bahamian police on drug raids, and we maintain an extensive radar network in the Caribbean. We recently transferred, at no cost, 26 Army (UH-1H Huey) helicopters to the State Department in support of law enforcement efforts. We also provide training for Drug Enforcement Agency (DEA) and other drug law enforcement personnel in such areas as survival skills, map reading, firearms, and equipment operation. The program will soon be expanded to include foreign language training for DEA agents. New training initiatives in jungle operations and land and water navigation have greatly improved the capability of DEA agents assigned in support of State Department South American counter-narcotics programs and operations.

D. DEFENSE INSTALLATIONS

1. Introduction

Our system of defense installations provides the means by which we base forward-deployed forces and materiel, maintain power-projection capabilities, ensure ready, flexible deploying forces, and sustain the full range of operational requirements. Installations directly impact the responsiveness and readiness of our forces. A consistent program of resourcing installation and facility needs will provide the infrastructure required to preserve our defense capabilities.

2. Base Closure and Realignment

Increasingly scarce resources have mandated a thorough assessment of defense priorities and the elimination of expenditures that have a low investment return. Installations which no longer effectively support strategic goals and those that are underutilized fall into this category. The base closure and realignment initiative is expected to save money by: combining or eliminating operational functions; selling assets no longer required, thereby returning these dollars to productive use; and eliminating the cost of maintaining unneeded bases. The savings realized by closing a base are significant but are achieved in the long term. Although up-front costs may also be significant, the end result is a more efficient defense infrastructure which allows resources to be focused upon other higher-priority needs.

a. Background

The process of determining which bases to close or realign has been complex. The Commission on Base Realignment and Closure, formed in May 1988, was tasked with developing the best process and criteria for identifying bases, reviewing the current and planned base structure, and making recommendations concerning which bases to close or realign. Financial considerations, as well as effects on the mission, environment, and community, were thoroughly analyzed.

In October 1988, the work of the Commission was given legal status through legislation drafted by DoD and overwhelmingly passed by the Congress. The law required the Commission to provide its recommendations to the Secretary by December 31, 1988 for approval or disapproval of the total package by January 16, 1989. I have approved the Commission's report, and, pending final congressional review, all recommended realignments and closings will begin January 1990 and be completed by September 1995.

b. Key Issues

(1) Environmental Protection

Although we are strongly committed to environmental protection, a waiver to the protracted National Environmental Policy Act (NEPA) procedures is necessary to ensure timely action on realignments and closures. The October 1988 legislation provides this waiver. This will expedite the environmental review process, minimizing the adverse impact on the people affected, and removing impediments to prompt provision of economic readjustment funds to the affected areas. The Secretary will conduct environmental impact analyses required by NEPA at the gaining and losing installations.

(2) Property Disposal

The law also makes us responsible for the disposal or reuse of excess property and accountable for the construction resulting from relocated missions.

(3) Effects on the Community

We take great pride in the communities that support our bases and are committed to moving quickly to help these people adjust to alternative base uses. A major misconception associated with base closures is that the local community will invariably suffer devastating economic setbacks. While the effect on a community must not be trivialized, the facts show that most communities affected by previous base closures have experienced strong economic recovery.

The economic adjustment process is a dynamic and effective one that involves the use of local, state, and federal government resources as well as those from the private sector. From 1961 to 1986, 100 communities have replaced 93,400 former DoD civilian jobs with 138,000 new jobs on former military bases. In addition, DoD has reduced the impact of base closures by finding new jobs for 60 percent of its affected civilian employees, while providing retirement benefits for another 20 percent.

(4) Alternate Use

The Defense Authorization Bill for FY 1989 required the President to establish a Commission on Alternative Utilization of Military Facilities, a separate commission unrelated to the Base Closure Commission. Its purpose is to identify DoD facilities or parts of facilities that could be used or renovated to serve as

minimum security prisons or drug treatment facilities for nonviolent drug abusers. We are the lead agency in this process. In addition, we are working to provide additional facilities for the homeless.

3. Military Construction

From FY 1982 through FY 1989 we received $44.7 billion in appropriations for the construction of facilities for new missions, people programs, physical plant modernization, and national programs, such as environmental restoration and housing for the homeless. Chart II.D.1 provides a funding breakout.

People programs are the heart of our business. Since FY 1982 we have received appropriations for 27,495 new family housing units, some 250,000 new or renovated bachelor housing units, 175 hospital/clinic projects, 130 child-care center projects, 100 physical fitness center projects, 156 school projects, and 44 religious facility projects.

4. Real Property Maintenance (RPM)

Investing in maintenance and repair protects DoD's $500 billion physical plant. Since 1980, over $40 billion has been invested in the minimum maintenance and repair necessary to keep our facilities, including family housing, operating. In real terms, however, RPM has shown a 22 percent decline since FY 1987, and future funding levels must be raised. The FY 1990 and FY 1991 budgets reflect 7.8 percent and 11.5 percent real growth, respectively, over FY 1989; however, they are still significantly below FY 1987 levels.

5. Foreign Facility Investment

The lack of adequate facilities in some overseas areas continues to affect military readiness, operational efficiency, and quality of life for our military personnel and their families. There is a continuing need for appropriated funds to satisfy essential construction overseas, even though many of our facility requirements are funded by our allies.

The common-funded NATO Infrastructure Program, which has increased funding by some 60 percent since 1985, continues to provide most of the U.S. wartime-required operational facilities in Europe and Iceland, as well as some on the east coast of the United States. Our forces benefit significantly from these NATO programs that currently average $2 billion annually. They provide airfield facilities, fuel and ammunition storage, naval piers, command and control equipment, early warning radars, aircraft shelters, and a wide range of other operational facilities.

Construction Appropriations (FY 1982 - 89) (Dollars in Billions - Current Year)

Chart II.D.1

People Programs $11.8 (26.4%)

Physical Plant and Infrastructure Modernization $22.4 (50.1%)

New or Changing Missions $9.2 (20.6%)

National Programs $1.3 (2.9%)

Total $44.7 Billion
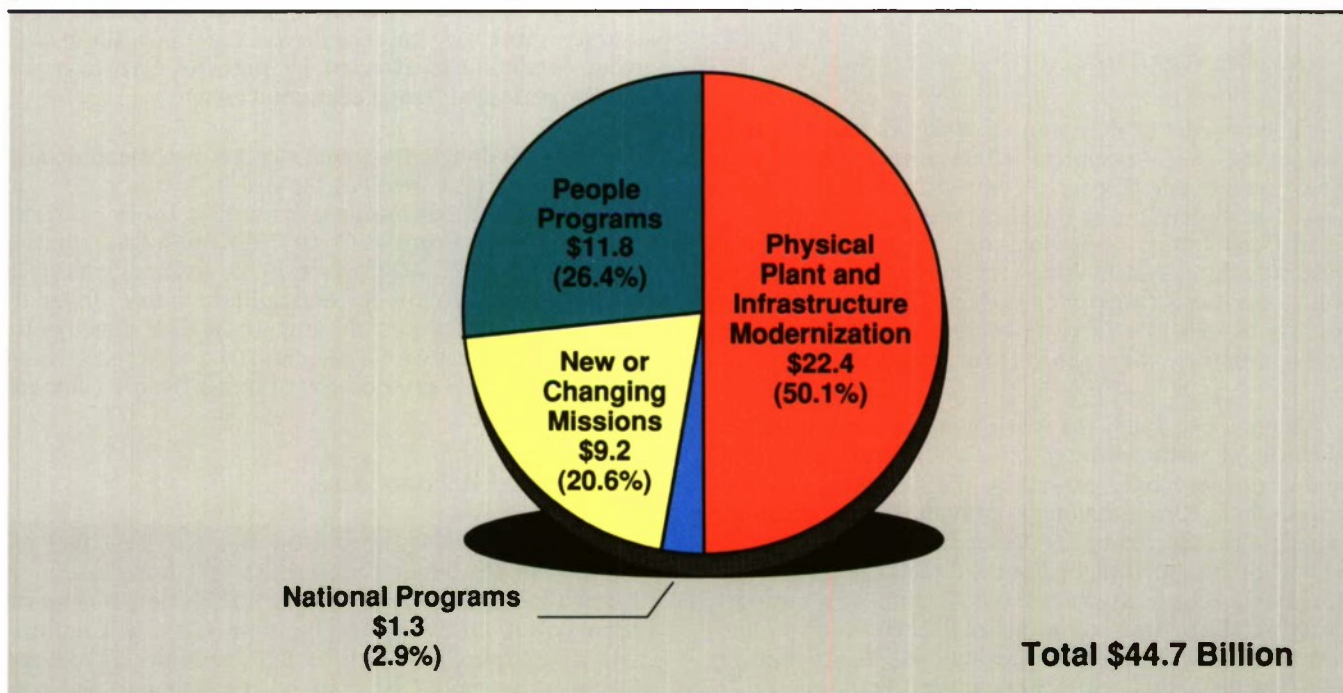
In the Far East, the Japanese-funded Facilities Improvement Program has been providing facilities for U.S. forces since 1979. The Japanese provided $650 million in FY 1988. In total aid, Japan provides the most generous host-nation support of any ally. The Republic of Korea's Combined Defense Improvement Projects (CDIP) program provides facilities to enhance our combat readiness, thereby improving our ability to assist the Koreans in their defense. The FY 1982-88 program totaled $408 million. Typical projects included fuel and munition storage facilities, munition maintenance facilities, and aircraft revetments and shelters. Details on these programs and other burdensharing issues are provided in Chapter I.D.

6. Better Business

Our people continue to break new ground with ideas and management initiatives which increase productivity and save money, thereby increasing mission readiness.

- *Model Installation and Graduate Programs:* These programs provide installation commanders the flexibility to accomplish their missions more effectively and efficiently.

- *Excellent Installation Approach:* This concept was initiated in 1981 to fight the natural tendency of large organizations to ration authority, to over-centralize, and to over-regulate. It places authority with the commanders.

- *Unified Budget Test:* In October 1986, Deputy Secretary Taft challenged six installation commanders to improve their mission performance by eliminating the predetermined subdivisions in their budgets. The result has been an increase in mission performance.

- *Commander in Chief's Award for Installation Excellence:* President Reagan established this award in 1984. Each Service selects and honors the installation which has been most successful in sustaining the mission, increasing productivity of the work force, and enhancing the quality of life.

- *Diversification and Encroachment on DoD Installations:* DoD recognizes the impact mission realignment may have on the local communities. We requested amendments to our community planning assistance authority which would permit cooperative solutions with these communities.

- *DoD Homeless Assistance Program:* Since 1983 DoD has spent over $4.0 million for facilities renovation and repair of 14 shelters for the homeless. In addition, the Defense Logistics Agency (DLA)

has provided over $3.9 million in bedding items, and the commissary system has donated over six million pounds of food.

- *Private Sector Financing:*

  - *801 Housing:* (Build for Lease): In this program, we pay a contractor to build and lease units to DoD for 20 years when a savings over military construction (MilCon) can be demonstrated. We currently have over 4,000 housing units completed and occupied.

  - *802 Housing:* (Rental Guaranty): In this program, housing is built to DoD requirements, rents are paid by individual Service members, and the government guarantees occupancy. The cost is potentially less than MilCon.

  - *Energy Projects:* We are avoiding nearly $1 billion in construction costs by allowing private investors to build needed co-generation facilities. Industry designs, constructs, and operates an energy plant on our bases, and we purchase the steam, hot water, or electricity produced.

  - *Other Private-Sector Financed Projects:* We are pursuing test projects in administrative and logistics facilities, transient lodging, sewage plants, and other areas in which private industry is requested to design, construct, own, and operate the facilities. Results from test projects under this authority will be available in FY 1989.

7. The Future

To reverse a downward trend in total facilities investment (see Chart II.D.2), we have established seven goals for the 1990s.

1. Increase facility investment to modernize our physical plant. Currently we invest at a rate of only one-third that of large corporations.

2. Attract additional private investment to augment appropriations for DoD support facilities.

3. Expand the concept of the unified installation budget.

4. Reduce the regulatory burden on installation commanders.

5. Identify and publicize bases which have demonstrated a commitment to providing quality base services, through the "Paragon Project."

Trend in DoD Facilities Investment

Chart II.D.2
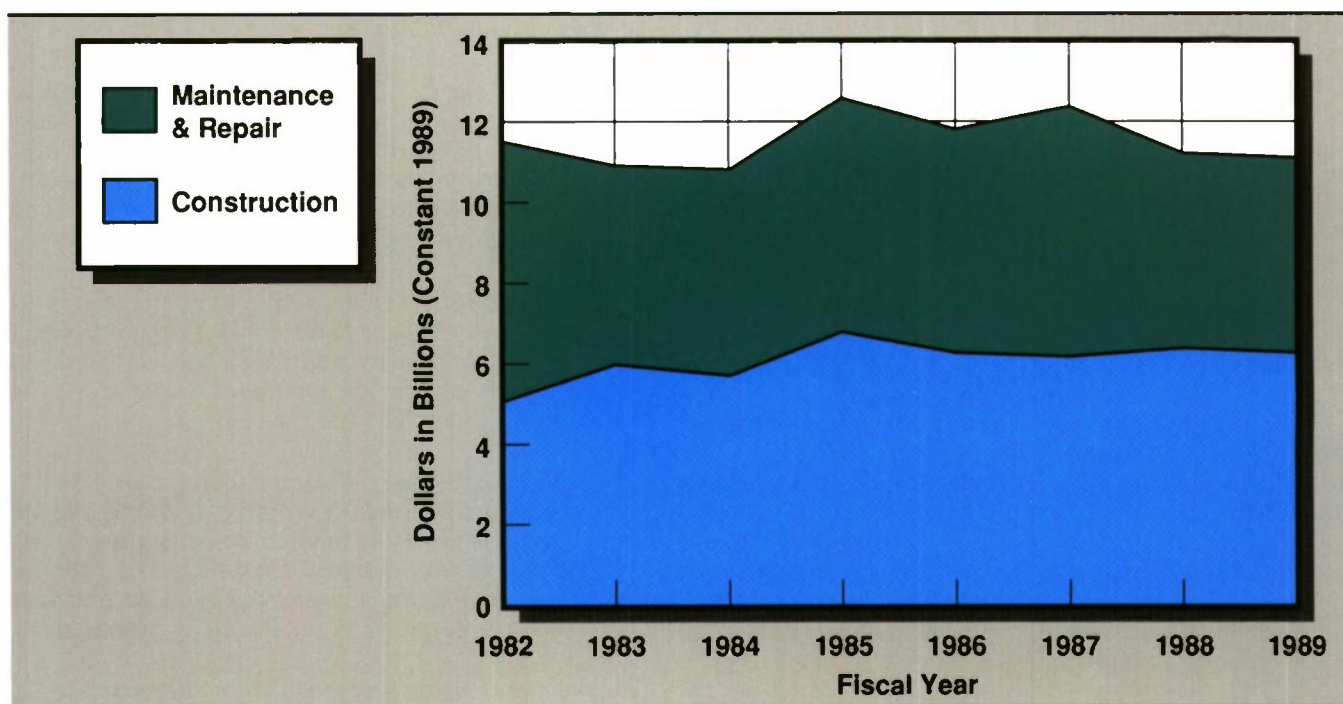
6. Institutionalize quality in-service contracting.

7. Establish cross-Service information-sharing by installation commanders.

Our overall goal is to ensure that we provide the quality installations needed to execute defense missions effectively in peacetime or in war. We must provide excellent places for our people to work and live, and excellent installation services. Obsolete facilities are expensive. They cost us by lowering productivity, decreasing work quality, and reducing pride. If we want to attract and keep the best people and get the most from them, we must invest more in their living and working environments.

E. THE DEFENSE INDUSTRIAL BASE

1. Introduction

Our nation has a long history of innovation and an ability to utilize our abundant national resources as feed stock for an efficient and effective industrial machine. Our industrial accomplishments during World War II were unprecedented. Our economy and standard of living were envied throughout the world, both fed by the marvelous machine we call our industrial base. There appeared to be no limit to its accomplishments. But in the 1980s we are witnessing an erosion in this critical defense foundation.

Today, our once self-sufficient military supply base has become vulnerable. We have become dependent on offshore suppliers for critical components of our weapon systems. Our technological superiority has declined and in some cases vanished. Acquisition policy complexities and instability, coupled with changes in trade, tax, environmental protection, socioeconomic and foreign policies, have decreased defense-industry profits, risk-taking and technological advance. The price-earnings ratios on military company stocks are at a 25-year low. Many military contractors are not willing to take the increased financial risk and are abandoning the defense business altogether. Many others are protecting short-term results by reducing their investment in new technologies.

These are serious challenges that must be addressed now. Our strategy of deterrence and ultimately our national security depend upon the continued productive capacity of our industrial base.

2. Bolstering Defense Industrial Competitiveness

In June 1987, we initiated an 18-month comprehensive assessment of problems facing the U.S. defense industrial base. Our objective was to identify the steps that must be taken to strengthen our defense industrial competitiveness. The final report's message was clear: cooperation is an essential foundation to meeting and sustaining defense goals. Our cooperation with industry, with our allies, with other agencies, and with the Congress is imperative to meet increasingly sophisticated requirements with relatively fewer resources.

The report addressed issues and provided recommendations specifically related to Defense Department policies and practices, as well as those related to a national agenda requiring actions beyond the scope and authority of the Department. The recommendations are already being put into action. They center around six major thrusts:

- Forging the right relations with industry;

- Improving the acquisition system;

- Establishing defense industrial strategic plans that support our military strategic plans;

- Developing manufacturing capabilities concurrent with development of weapon systems;

- Laying the foundation now for the technical skill base required for tomorrow's defense needs; and

- Ensuring that industrial base issues important to our defense benefit from the full spectrum of potential policy remedies, when appropriate.

The following is a brief summary of some of the more significant actions under way:

a. *Organizational Realignments*

Certain organizational changes were deemed necessary to enable us to deal with the issues identified. The most significant organizational action we have taken is the establishment of a Department production base advocate. This senior executive is expressly charged with continuously refining and executing a coherent program to improve the efficiency and effectiveness of defense industrial base manufacturing operations. To perform this function, a new Deputy Under Secretary of Defense for Industrial and International Programs has been established, providing a single focal point within the Office of the Secretary of Defense for receiving, evaluating, testing, and implementing innovative production concepts within the defense industrial base. This new Deputy Under Secretary will provide departmental liaison with the private sector and other government departments and agencies in manufacturing-related matters and will ensure consideration of manufacturing issues in acquisition policy and programs.

b. *Defense Manufacturing Board*

To bolster defense industrial competitiveness, we need to build appropriate cooperative relations with industry. To this end, we have established a Defense Manufacturing Board to serve in an advisory capacity

to the Under Secretary of Defense for Acquisition. It is composed of experts appointed from defense and non-defense industries at the vendor and supplier level, and from labor and academia. The Board will focus specifically on how we can better utilize our resources to improve overall quality and manufacturing effectiveness. This is the first permanent board established within the Department of Defense to focus on manufacturing issues.

c. Manufacturing Strategy Committee (National Academy of Sciences)

We are working with the National Academy of Sciences to improve our sensitivity to industry needs. The Academy has organized a committee and an agenda to work in parallel with the Defense Manufacturing Board in providing industry's perspective on national manufacturing issues.

d. Analytic Capability

The Department has two significant data base systems which are key to industrial base assessments. The Defense Industrial Base Network (DINET) is a prototype information system designed to monitor the U.S. defense industrial base. It provides information on the status of U.S. industries, including the identification of essential suppliers, key relationships between components and weapon systems, and constraints that would affect a rapid increase in the production of critical items. The second system is Project SOCRATES which enables us to identify industrial technologies critical to maintaining a robust, internationally competitive industrial base. This is a planning support system that provides the planner and decisionmaker with a breakdown of technology that is available worldwide into its component commodities, to include technology alternatives and relationships. Further, it tracks technology capabilities in terms of years ahead or behind the United States, and in terms of commodity parameters.

e. Strategic Planning Task Force

A Strategic Planning Task Force is being formed to develop a DoD Industrial Strategic Plan. This plan will utilize Service inputs to determine the best way to provide industrial support for military operational plans and determine which ones should be supported by industrial strategic planning.

3. Quality and Productivity Initiatives

a. Total Quality Management (TQM)

The quality of DoD materiel and management systems has a significant bearing on the cost and performance of our weapon systems. TQM is a major DoD strategy that is dedicated to ensuring the highest level of quality and productivity at every step of the design and manufacturing process and at every management level.

The concept combines fundamental management techniques, existing improvement efforts, and specialized technical skills under a rigorous, disciplined approach focusing on improving all DoD production processes. A DoD master plan has been developed identifying the management structure that will implement the strategy and five key concepts: the prevention of defects rather than after-the-fact detection; a focus on the processes that result in products and services; a dedication to continuous improvement in these processes; a requirement for teamwork within DoD and between DoD and industry; and the application to all categories of work, blue-collar and white.

Of most importance, TQM seeks to engender in each individual a sense of responsibility for quality throughout the entire manufacturing process. Programs and processes will fall short in meaningful implementation of TQM unless they are managed and adhered to by individuals who recognize the importance of customer satisfaction, teamwork, and pride in workmanship.

b. Acquisition Streamlining

Acquisition Streamlining is a major DoD initiative directed at reducing the time and cost, and improving the quality of DoD weapon systems acquisitions. The goal is to tap the ingenuity of government and industry personnel, deferring decisions on contract requirements until we have better knowledge upon which to base those decisions. The streamlining approach is being applied to all new weapon systems acquisition programs. Thirty-eight pioneer programs have been identified for initial implementation. An analysis of these programs indicates that streamlining is reducing significantly both weapon systems acquisition time and cost.

Flag-level streamlining advocates have been identified at most of the principal DoD weapon systems acquisition centers. Over 10,000 key personnel have attended streamlining training courses developed for engineering and contracting personnel. The military departments, with industry's assistance, are identifying

outdated and unnecessarily costly military specifications and standards.

c. *Value Engineering*

Our value engineering program provides an incentive for industry to design the highest-quality product for the least cost. This is done by identifying methods of accomplishing essential functions more efficiently. We have used it to improve productivity in conjunction with reverse engineering, acquisition streamlining, and design-to-cost operations. Defense components have reported increased benefits from in-house and contractor value engineering investments, and in the future, we expect it to not only lower cost but to improve quality and conserve time.

4. Industrial Base Programs and Initiatives

a. *Manufacturing*

(1) Manufacturing Technology Program

The Manufacturing Technology (ManTech) Program is a broad-based, production-oriented program supporting our research, development, and acquisition programs. It provides new and innovative manufacturing technology needed to produce DoD materiel in those cases where the private sector is unable or unwilling to produce it in a timely manner. ManTech is often a critical link between product development and economical production.

During the past year several mature ManTech investments have recently been evaluated by independent auditors. Examples of investments which have provided benefits to the nation include:

- *Gallium Arsenide:* A ManTech sponsored improvement in gallium arsenide production technology provided DoD over $36 million in benefits during the period of 1982-1987. ManTech invested $500,000, and our contractor invested $4 million. From 1987 to 1992, the Navy alone is expected to accrue benefits of $130 million.

- *Liquid crystal light valves:* A mid-1970s ManTech $1.5 million investment improved liquid crystal light valve quality and provided the U.S. government benefits of over $76 million (1977-1987). We expect to accrue an additional $50 million in benefits over the next two years.

(2) Industrial Modernization Incentives Program

The Industrial Modernization Incentives Program (IMIP) is a major DoD initiative to foster long-term defense industrial base modernization. The program's objective is to increase defense contractors' capital investments to enhance productivity, improve quality, reduce acquisition costs, and expand the industrial base.

IMIP benefits can be measured in terms of increased flexibility, increased capacity to respond to defense requirements, and savings realized throughout the life cycle of the weapon systems produced in IMIP-modernized facilities. Present emphasis is focused on obtaining full Service participation and increasing participation at the subcontractor and vendor levels.

b. *Government-Owned Industrial Property Initiatives*

We have placed considerable attention on the management of government-owned property during the past year. Our basic policy requires that the private sector provide production facilities to the maximum extent possible. Our objective is to improve the acquisition, management, control, and disposal of government property in the possession of contractors or in storage.

Several years ago we examined our government-owned property management program and found several disturbing trends which included:

- An increase in the amount of property with contractors;

- Improper property acquisitions;

- Lack of disposal of excess and unneeded property;

- Inadequate property accountability; and

- Lack of management attention and priority.

Over the past two years we have worked to correct the deficiencies. We have emphasized the problem in our overall internal management improvement plan. We have also established four performance measures to assure that the job gets done. DoD components are required to:

- Report quarterly to my Deputy Secretary on their compliance with established DoD property policies;

- Remove excess/nonessential property from contractors' plants and storage locations;

- Establish improved property accountability and financial accounting systems; and

- Fully implement changes to the Federal Acquisition Regulation and Defense Acquisition Regulation Supplement.

c. *Defense Production Act -- Title III*

Our policy is to rely on consumer demand to generate sufficient incentive for industry to sustain a manufacturing capability for materials that are critical to our defense needs. Most of these materials are required by both the commercial and defense sectors. In certain circumstances, however, private investors are unable or unwilling to provide the production capacity we need. In such cases, Title III of the Defense Production Act provides us with the option of offering purchase commitment incentives to private companies if they will establish the desired capacity. We have $39.0 million in Defense Production Act, Title III contracts and $53.5 million in requests for proposals.

d. *Strategic and Critical Materials*

By a 1988 Executive Order, the Secretary of Defense was designated the National Defense Stockpile (NDS) Manager. The primary tasks in this capacity are to identify the military and essential civilian requirements for strategic and critical materials that would be needed during a national emergency; acquire, store, and dispose of stocks of such materials; develop policies to conserve and develop domestic sources of such materials; and provide recommendations and reports to the Congress on stockpile requirements and operations. The purpose is to sustain essential military, industrial, and civilian users in a national emergency.

The National Defense Stockpile of Strategic and Critical Materials contains 93 nonfuel materials with a value of over $9 billion stored at more than 100 locations throughout the United States. The inventory contains a diverse range of materials such as copper, lead, tin, titanium, cobalt, germanium, vanadium, rubber, mica, industrial diamonds, and iodine. Of the total inventory, about $2 billion in value is excess to currently defined requirements and, with the agreement of the Congress, will be disposed of as markets allow. Proceeds from those sales will be deposited into the NDS Transaction Fund to be used for the purchase of new materials or the processing of existing inventories into upgraded forms more suitable for storage or use.

Major steps are under way to synchronize stockpile planning with military strategies. The military Services and the Joint Chiefs of Staff are developing estimates of military requirements for strategic and critical materials directly from warfighting plans. The Department is working with civil agencies to identify the essential civilian requirements for the Stockpile.

The Department has launched an initiative to modernize the Stockpile. This initiative consists of: upgrading the quality and form of existing inventories to support the accelerated production of military hardware and materiel during a national emergency; the identification and acquisition of new advanced materials needed to support such defense production; the upgrading of specifications for NDS materials to modern industrial standards and use; and the modernization of methods for acquiring/upgrading/disposing of NDS materials to conform to present commercial practices.

e. *Defense Standardization Program*

To obtain the quality we need in our weapon systems, the specifications and standards we use must be current, accurate, and concise. The Defense Standardization Program is undergoing changes to achieve this end and to bolster industrial competitiveness, emphasize quality, and encourage greater use of commercial products. Each military department and Defense agency has designated a "Standardization Executive" whose primary task is to strengthen his organization's standardization program through better planning, increased accountability, expanded industry interface, and continuous quality improvement of the specifications and standards needed for acquisition. Special emphasis is being focused on replacing military specifications and standards with those prepared and used by the private sector. A major effort to automate authoring, distributing, and applying our specifications and standards will significantly improve efficiency and simplify access to information by government and contractors.

f. *North American Defense Industrial Base*

During the past year, we have strengthened our relationship with our Canadian allies through the North American Defense Industrial Base (NADIB) organization. The objective of both nations is to ensure that our combined industrial resources can be directed at supporting the emergency and mobilization needs of either country. This relationship is built upon nearly 50 years of defense economic cooperation in support of our mutual security needs. The NADIB is working to further integrate our industrial bases and is promoting closer industrial preparedness planning. Industrial specialists from NADIB subcommittees meet quarterly to work on joint issues.

g. *Environmental Programs*

Environmental quality is an integral part of the DoD mission that provides essential benefits to the nation as a whole. The Department's goal is to integrate environmental protection into all its activities, including acquisition, production and testing, training, and operation and maintenance. Programs in pollution abatement, materials and land management, and natural resource protection are well established and have achieved commendable results. Part of this success is attributable to cooperation by federal and state agencies, and public participation. DoD is taking a leadership role in areas such as protecting the stratospheric ozone layer, reducing the generation of hazardous wastes, pest management, and research and development for military-unique problems. Over the past few years, the Department has committed considerable resources to its Environmental Restoration Program for cleanup of hazardous waste sites associated with past activities.

5. Conclusion

The nation's economic well-being and our ability to defend ourselves depends, to a great extent, on the strength and vitality of our industrial base. During the past year, we have taken a number of steps to improve our industrial responsiveness. We have increased our commitment to improve the nation's defense posture and the ability to respond to any national emergency in a number of areas. Perhaps most importantly, we have put in place a framework for establishing an infrastructure with the potential to identify negative trends early enough to prevent major industrial disruptions to our materiel pipeline. While we have made substantial progress toward our goals, there is still a long way to go. We must sustain our commitment if we are to maintain the industrial infrastructure necessary to support our fighting forces worldwide, both in peace and in war.

Part III
Defense Programs

A. LAND FORCES

1. Introduction

a. Force Rationale

The land forces of the United States are charged with deterring war and, should deterrence fail, with defending and seizing land areas vital to U.S. national security interests. Consisting of the Army and the Marine Corps (less tactical aviation elements), these are our only forces capable of performing this most crucial mission. Our ability to station land forces in, or deploy them to, areas of vital interest signals our national commitment to protect the security of those areas. Thus, a significant portion of our land forces are forward deployed in Europe and the Far East. Our remaining forces exist to reinforce the forward-deployed units in time of war and to move rapidly to other areas where we do not maintain permanent deployments.

Our land forces are structured to meet a variety of threats worldwide. In Europe, they must be capable of opposing the heavily armored, tactically mobile forces of the Warsaw Pact. Elsewhere, they must be able to deploy rapidly to trouble spots as a "show of national will" or for operations against less sophisticated forces. The trend toward increasingly sophisticated arms in Third World military forces complicates planning for this latter mission.

Because of the variety of contingencies against which we must plan, structuring our land forces has become an increasingly difficult task, requiring sophisticated analysis of the threat and of our own capabilities. Today's structure is designed to balance the requirements for heavy, light, and special operations forces (SOF); forward-deployed forces and forces based in the continental United States (CONUS); and active and reserve forces. Heavy forces provide extra mobility and firepower for operations against a mechanized foe. Light forces are rapidly deployable and are especially useful in restricted terrain. Special operations forces are trained and equipped for operations in hostile areas and are tailored for rapid response. Forward-deployed units deter enemies and reassure allies, while units in CONUS allow for rapid reinforcement and power projection. Active-duty personnel make both forward deployment and rapid reaction possible. Reserve forces expand total mobilization capacity and contribute to the deterrent capability of U.S. land forces.

In structuring these forces and balancing their needs against threats to our national interests, we apply the following guidelines: First, we must maintain forward-deployed forces to supplement allies in deterring those who threaten our most vital interests. Second, we must maintain CONUS-based forces to reinforce our forward-deployed units should deterrence fail. Third, we must maintain sufficient rapidly deployable forces to protect our interests in possible conflict areas where troops are not already positioned. Fourth, we must maintain adequate combat support and combat service support capabilities to sustain our combat forces in peacetime and war. Fifth, we must maintain a balanced mix of active and reserve forces to reduce both risk and expense. Sixth, where possible, we should seek to maximize our rapid deployment capabilities by prepositioning equipment and supplies in areas of critical interest. Seventh, we should maintain sufficient stocks of war-reserve equipment and supplies to sustain our deployed forces until a mobilized production base can meet wartime demands.

b. Program Goals

Today, the Army maintains a force of 28 divisions. Together with our Marine forces, these are adequate to meet our national security requirements. Since the size of the force is capped, we must keep our units as trained and ready as possible. Eighteen of the Army's divisions are, therefore, in the Active Component. The majority of nondivisional combat, combat support, and combat service support units are in the reserves. The Army also maintains both active and reserve brigades, unattached to divisions, for regional defense in locations such as Berlin, Panama, and Puerto Rico. The Marine Corps maintains three active divisions and associated support elements for use in three Marine Expeditionary Forces, along with one Reserve Component division to augment these forces in wartime.

c. Summary of Progress, 1981 to 1988

We have made significant progress in improving the capability of our land forces since 1981. Perhaps the greatest increase has come in the area of modernization. The Army has upgraded its tank fleet with the deployment of the M1 Abrams tank. It also has fielded the Bradley fighting vehicle, and has initiated a development program to keep its antiarmor weapons competitive with continuing enhancements in Soviet armor. The capabilities of Army attack helicopter units have increased with the deployment of Apache (AH-64) helicopters, while assault helicopter companies have been modernized with Blackhawk (UH-60) aircraft. Artillery capabilities have improved with the fielding of the Multiple-Launch Rocket System (MLRS) and the Copperhead projectile. The Army's tactical wheeled-vehicle

fleet has been modernized with heavy expanded mobility tactical trucks (HEMTTs) and high-mobility multipurpose wheeled vehicles (HMMWVs), and will be improved further in future years with the introduction of a new family of medium tactical vehicles (FMTV) and a palletized loading system (PLS).

The Marine Corps has likewise undertaken an extensive modernization of its equipment over the past eight years. Systems introduced include the light armored vehicle (LAV), M-198 howitzer, logistics vehicle system (LVS), HMMWV, F/A-18 aircraft, and AH-1W and CH-53E helicopters.

The readiness of our land forces has improved through increases in the quantity and quality of training, and through the continued enlistment and retention of high-quality personnel. The opening of the National Training Center (NTC), with its instrumented battlefield, in 1982 and the Joint Readiness Training Center (JRTC) in 1988 has produced a significant increase in the intensity and realism of training available to Army combat units. The Combat Maneuver Training Center (CMTC) in Germany, scheduled to begin operations in 1989, will provide further improvements in training quality. Increases in the number of field exercises in the United States and abroad, and in the quantity and sophistication of simulators and other training devices, also have enhanced land force readiness.

We have made slow but steady progress in improving combat sustainability over the past eight years. Stocks of major equipment and secondary items have increased from their 1981 levels. High costs and fiscal constraints have, however, slowed the rate at which further improvements can be made.

2. Force Structure and Composition

a. Force Structure

We have made no significant changes in our force structure over the past year (see Table III.A.1). The FY 1990-91 budget supports a 32-division force with 21 active divisions (18 Army and three Marine) and 11 reserve divisions (10 Army and one Marine). Although this represents an increase of two active and two reserve divisions since 1980, it does not translate into a comparable net increase in capability, since it was achieved primarily through reallocating existing Active and Reserve Component forces. Two-thirds of the support structure remains in the reserves, and we continue to rely on our European and Asian allies for a significant amount of support.

Army and Marine Division Structure

Table III.A.1

	Heavy [a]	Light [b]	Total
Active Army Divisions			
Fully Active	5	4	9
Roundout (Bn)	3	—	3
Roundout (Bde)	4	2	6
Army National Guard	4	6	10
Active Marine Corps	—	3	3
Reserve Marine Corps	—	1	1
Total	16	16	32
Nondivisional Maneuver Brigades/Regiments [c]			
Active Army	6	2	8
Army Reserve Components	10	9	19
Total	16	11	27

[a] Armored, mechanized, motorized, and the 2nd Infantry division.
[b] Marine forces, infantry, air assault, airborne, light infantry.
[c] These units have not been assigned a roundout mission.

b. Force Composition

Fiscal constraints and a decision to restrain Army Active Component end strength have led to a greater reliance on the Reserve Components to bring active divisions to their authorized levels of combat, combat support, and combat service support in wartime. The number of active divisions requiring reserve augmentation has increased from four in FY 1980 to nine today. Reserve units assigned to active divisions are commonly called "roundout" units, and enjoy the same priority for equipment distribution as their parent active units. This practice provides fully structured divisions in time of war, and helps reduce the cost of manning and training our land forces in peacetime. If we obtain and act on intelligence information in a timely manner, most of these units should be able to enter combat with their parent unit.

c. Force Disposition

Chart III.A.I shows the location of the Army's and Marine Corps' active and reserve divisions. In addition to the force deployments shown, two brigades of CONUS-based Army divisions are stationed in Europe, and one Marine brigade is based in Hawaii. The Army also maintains one theater defense brigade and two armored cavalry regiments in Europe, a separate National Guard infantry brigade in Hawaii, five active and seventeen reserve brigades and regiments in CONUS, an active infantry brigade in Panama, and a National Guard infantry brigade in Puerto Rico.

3. FY 1990-94 Programs

a. Readiness

Readiness is a measure of a force's ability to fight with little or no warning. It remains our highest defense priority. We cannot base our preparedness on estimates of potential adversaries' intentions, as they could change quickly. Rather, we must be prepared to defend against those forces' most formidable capabilities.

Training is the cornerstone of combat readiness. Early-deploying units will be only as ready for war as their peacetime training has made them; there will be little or no time to correct training deficiencies once a conflict has begun. Two useful measures of land force training are monthly flying hours per helicopter crew and ground operating tempos (Optempos). Helicopter crews have been averaging around 14 hours' flying time per month since 1980; ground Optempos, measured in tank mileage, have fluctuated over the past few years.

Fiscal constraints have forced the Army to reduce its average annual tank mileage from 850 to 800 miles in FY 1990 and beyond, and to cancel a planned increase in monthly flying hours. At the same time, the increased availability of simulators and other training devices, as well as the increased number and use of combat training centers, have enhanced training and will help to maintain readiness. The type of training provided by such facilities as the NTC at Ft. Irwin, California, has been shown to be the most rigorous and realistic that Army combat units receive. Battalion rotations to this center and the two new centers previously mentioned are shown in Chart III.A.2.

Training of Marine ground units is measured in terms of field training days per battalion. An essentially constant level of training is projected in FY 1990 and beyond for these units. In FY 1988, the Marines introduced an infantry training program for all members called Marine Battle Skills Training. Under this program recruits receive six weeks of intensive infantry training.

Readiness is also greatly enhanced by the infusion of modernized weaponry and equipment into our land force inventories. Some of these items relieve equipment shortfalls; more often, however, they replace older, less capable systems.

The condition of our equipment is another determinant of readiness. While funding for depot maintenance activities continues to increase, so does the cost of maintaining our weapons and equipment. Fiscal constraints do not allow us to fund all of our maintenance requirements, resulting in delays in required overhauls of tanks, aircraft, and other equipment. Chart III.A.3 shows the trends in Army depot maintenance funding and the maintenance backlog projected for future years.

b. Sustainability

Sustainability is a measure of a force's ability to fight over a period of time. Both the Army and the Marine Corps have met their highest-priority sustainability requirements in the face of tightened fiscal constraints, but insufficient resources are available to maintain growth in all categories of items. The Army has achieved limited growth in major-item sustainability (a category including major weapon systems such as tanks) and has maintained a constant level of spare parts sustainability, but has suffered a decline in munitions sustainability. Reduced funding for munitions may require us to close four or more ammunition plants and use some reserve stocks to provide ammunition for training. Munitions sustainability in the Marine Corps will likely decline as well.

Deployment of U.S. Divisions and Independent Brigades

Chart III.A.1

Alaska

Panama

Puerto Rico

Hawaii

Korea & Japan

Germany

		Divisions		Brigades/Regiments	
▲	Army	Infantry		Infantry	
■	Marine	Armor		Armor	
△	National Guard & Army Reserve	Air Assault		Air Combat	
□	Marine Reserve	Airborne		Armored Cavalry	
		Mech. Infantry		Mech. Infantry	
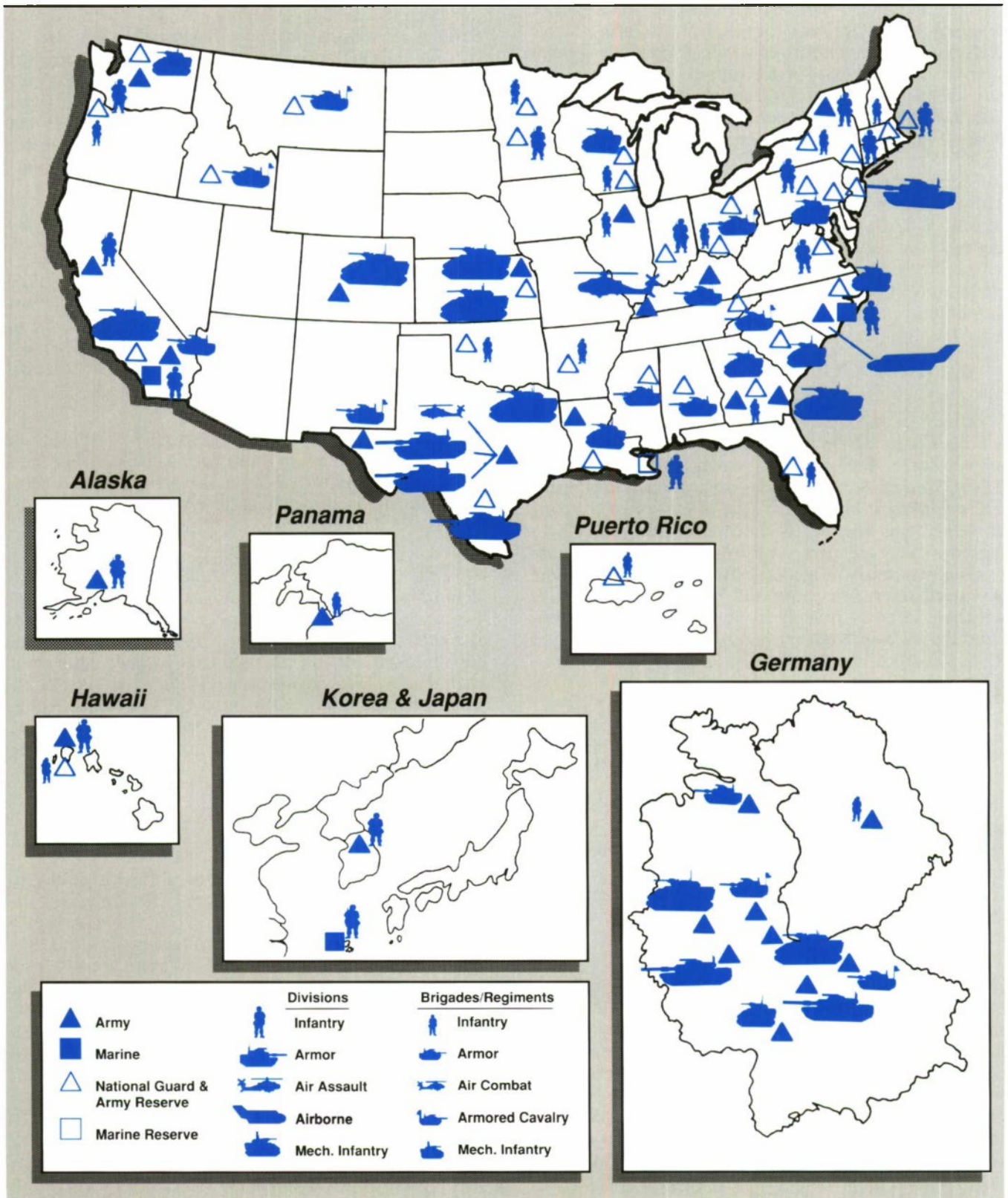
Training Center Rotations

Chart III.A.2

CMTC - Combat Maneuver
       Training Center
JRTC - Joint Readiness
       Training Center
NTC - National Training
       Center
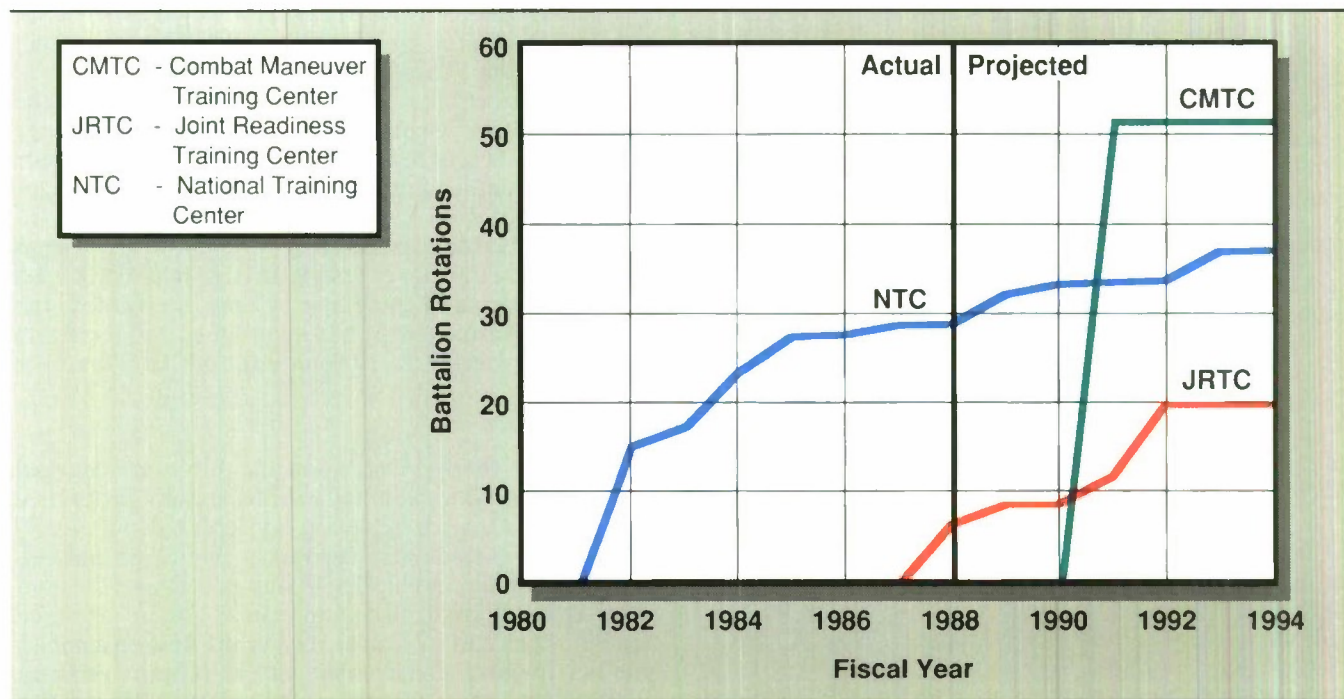
Army Depot Maintenance

Chart III.A.3
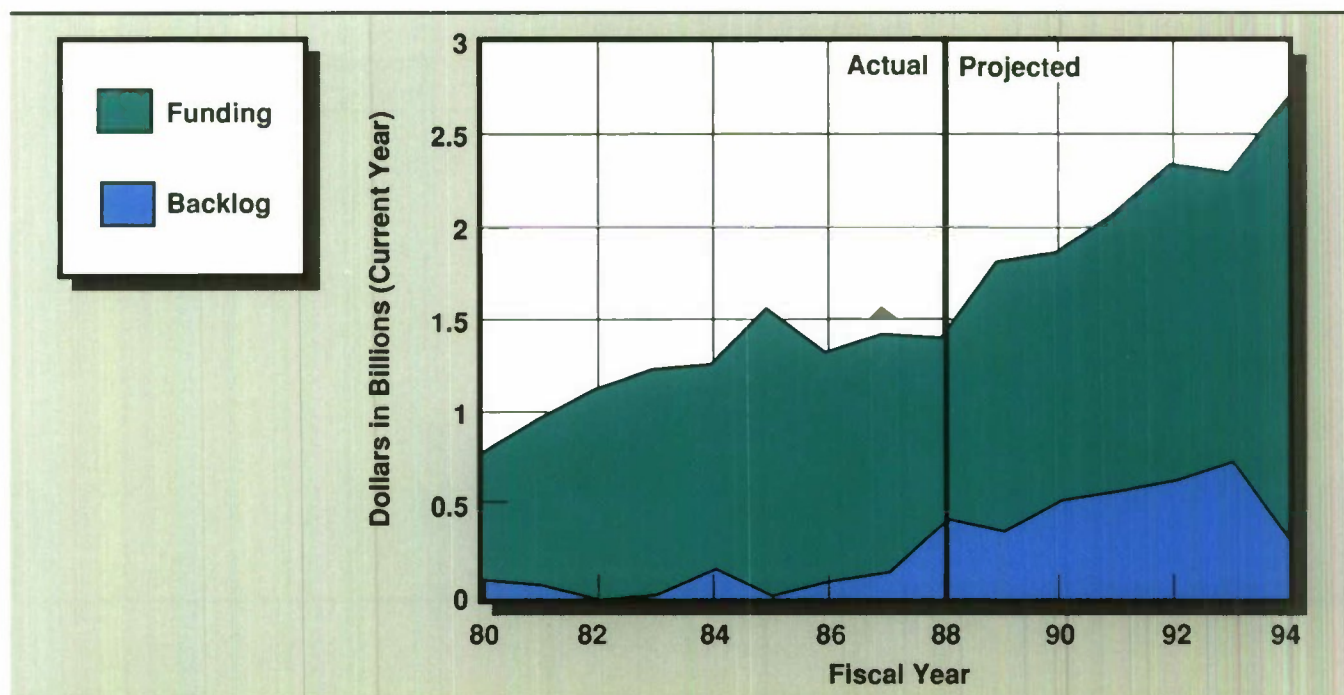
c. Modernization

(1) Close Combat

Ground combat weapons, vehicles, and antiarmor missiles support Army and Marine Corps forces in close combat operations. Our emphasis centers on continued fielding and upgrading of systems that will contribute most to maintaining our combat capability through at least the mid-1990s, and on critical armor/antiarmor programs.

M1A1 Abrams: The Army will focus on sustained production of the 120mm-gun M1A1 tank, incorporating improved armor protection. Additional improvements (Block II) in the M1A1 will also be part of the modernization effort. To match the rapid proliferation of advanced Soviet tanks and antiarmor improvements, and to enhance production efficiency, fielding of the M1A1 to the Marine Corps will be accelerated.

Light Armored Vehicle Assault Gun: As part of its continued fielding of the family of light armored vehicles, the Marine Corps will begin procuring an assault gun variant with FY 1992 funding.

Bradley Fighting Vehicle: Production and fielding of the M2/M3 Bradley, incorporating enhanced survivability and other improvements, will continue at a sustaining rate to complement M1A1 deployments.

Antiarmor Armament Programs: A variety of tank gun and antiarmor missile development programs will be continued. These include the joint DARPA/Army/Marine Corps armor/antiarmor program, the armor/antiarmor elements of the Balanced Technology Initiative (BTI), and programs such as the antiarmor weapon system medium (AAWS-M)/ antiarmor weapon system heavy (AAWS-H). The latter program is intended to provide a replacement for both the Dragon and TOW antiarmor missiles in the mid-1990s. To bridge the gap until these new systems are fielded, the Army and Marine Corps have continued to investigate potential replacements, including the Milan II and the Swedish Bill.

Both the Marine Corps and the Army are engaged in additional close-combat modernization programs. The Marine Corps is exploring concepts to maintain its amphibious forced-entry capability against an increasingly formidable threat. The Army is defining the concept, and designing the architecture, for an armored family of vehicles to replace its current fleet of combat, combat support, and combat service support vehicles. Both efforts are targeted toward a late-1990s deployment date.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
M1A1/2 Abrams				
Development:				
$ Millions	70.9	59.6	82.0	60.8
Procurement:				
Quantity	689	679	603	516
$ Millions	1,735.9	1,697.3	1,875.2	1,927.2
LAV				
Development:				
$ Millions	25.0	19.9	39.7	37.0
Bradley				
Development:				
$ Millions	21.6	21.6	9.7	7.0
Procurement:				
Quantity	550	581	600	600
$ Millions	701.2	683.4	649.6	692.0

(2) Land Forces Aviation

The FY 1990-94 program supports the Army's long-range goal of maintaining a helicopter fleet that is both affordable and effective against the threat. Toward that end, the Army is reducing the size of its fleet from about 8,500 helicopters today to some 6,500 by the end of FY 1994. Modern new systems now being deployed, such as the AH-64, UH-60, and OH-58D, and future ones, such as the LHX, form the centerpiece of a smaller but more combat-capable force. By the end of FY 1989, the Army will have eliminated 450 older training and administrative support helicopters and reduced its aviation personnel end strength by 2,200 as a first step toward paring the size of its aviation forces. Most of the planned reduction will come from replacing older, less capable aircraft with smaller numbers of modern machines in both active and reserve combat and support units. Chart III.A.4 depicts the planned transition to the future force structure.

The Marine Corps is modernizing its helicopter force by replacing AH-1Js/AH-1Ts with AH-1W Super Cobras and by procuring the tilt-rotor MV-22 Osprey to replace its aging fleet of CH-46E and CH-53A/Ds. The Osprey will provide the Marine Corps with entirely new and expanded combat capabilities for both amphibious and sustained operations ashore. The sur- vivability of both amphibious task forces and landing forces will be significantly enhanced by the Osprey's ability to launch from over the horizon. This capability will reduce the threat of antiship missiles and increase the opportunity for tactical surprise. Due to budget constraints, however, we have had to reduce the planned rate of procurement of the Osprey. Other difficult decisions, such as cancellation of the heavy-lift CH-53E helicopter after FY 1989, have been made to fund the Osprey program.

(a) Army Attack and Scout Helicopters

AH-64 (Apache): To date, the Army has equipped 15 of a planned total of 48 battalions with the AH-64, including three battalions stationed in Central Europe. Fifteen AH-64 battalions will eventually be assigned to the National Guard, the first unit of which received its aircraft in FY 1988. The Army plans to procure 72 AH-64s a year during FY 1990-93, toward an inventory objective of 975 aircraft. The FY 1990-91 budget provides funds to begin a five-year multiyear procurement program for the aircraft. As the Army's first-line antiarmor attack helicopter, the Apache must keep pace with the anticipated threat. The Multi-Staged Improvement Program (MSIP) supports the development of advanced systems and improvements in existing AH-64 technology. The Airborne Adverse-Weather Weapon

Army Modernization Goals

Chart III.A.4

Current (8,500 Helicopters)   **Future (6,500 Helicopters)**

Attack Battalion (Heavy Division/Corps)
13 OH-58 A/C   18 AH-64 → 10 LHX   15 AH-64

Attack Battalion (Light Division)
13 OH-58 A/C   21 AH-1 → 25 LHX

Cavalry Troop
6 OH-58 A/C   4 AH-1 → 8 OH-58D (ARMED) (INTERIM POTENTIAL) → 8 LHX

Lift Company
23 UH-1 → 15 UH-60
9 CH-54 → 8 CH-47D
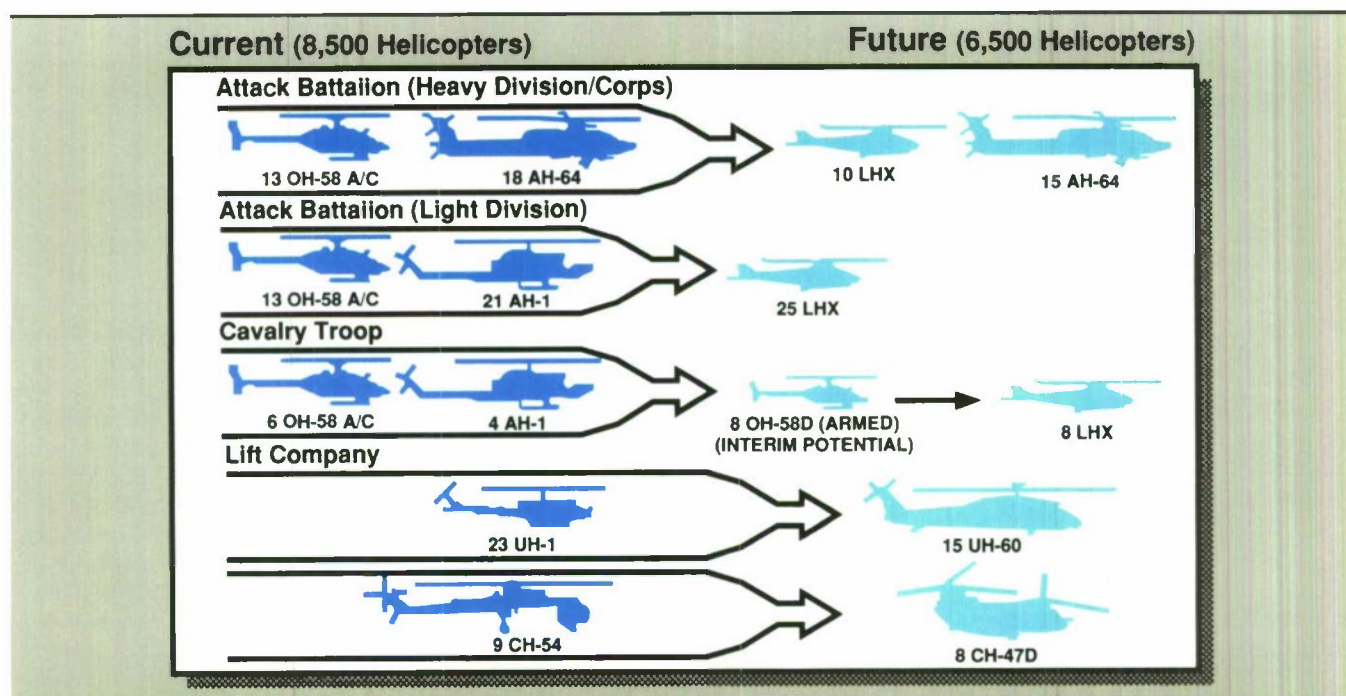
System (AAWWS), now under development, will potentially provide the AH-64 with a "fire-and-forget" Hellfire antiarmor missile. Fire-and-forget technology increases battlefield effectiveness significantly by allowing helicopters to evade enemy air defenses after firing their missiles.

OH-58D (AHIP): The OH-58D aerial scout will operate in support of artillery units in the field artillery aerial observer (FAAO) role and as an interim scout pending fielding of the LHX in the late 1990s. A version of the AH1P (Army Helicopter Improvement Program) will be fielded in air cavalry squadrons as part of the Army's aviation modernization program. It will be armed with the Hellfire antiarmor missile, and incorporate an interchangeable weapons suite of air-to-air Stinger missiles, Hydra rockets, and a machine gun. The armed AHIP program will begin in FY 1990 with the modification of new-production aircraft; retrofitting of AHIPs already fielded, excluding FAAO aircraft, will occur in future years. Recently concluded field tests have demonstrated the AHIP's utility in the aerial scout role, and a field test to demonstrate its utility operating in concert with attack helicopter units is planned for FY 1989-90. The Army will buy 375 AHIPs before the program's planned termination in FY 1994.

LHX (Light Helicopter Program): Under the LHX program, the Army is designing a modern, lightweight helicopter to replace its older AH-1, OH-6, and OH-58A/C systems, as well as the interim OH-58D. About 2,100 aircraft will be procured for use in light attack and armed reconnaissance missions, with initial purchases anticipated in FY 1995. An advanced-technology mission equipment package will give the LHX a superior ability to perform its missions at night and in adverse weather.

(b) Army Lift / Cargo Helicopters

UH-60 (Blackhawk): We will buy 144 Blackhawk aircraft in FY 1990-91, the last two years of a four-year contract. The rate of procurement will then drop to 60 aircraft a year in FY 1992-94 and continue at approximately that rate into the next century, as the Army builds toward an objective of more than 2,200 aircraft. The Blackhawk will be an essential part of our tactical lift forces for many years to come. Improvements are planned to keep the aircraft abreast of the projected threat and to enhance its performance and safety.

CH-47D (Chinook): Conversion of older-model CH-47s to the D configuration will conclude in FY 1992 with a total force of 455 aircraft. These improvements in the aircraft's performance and safety

will enable the CH-47 to remain a viable medium-lift logistics transport to the year 2000.

(c) Marine Corps Assault-Support Helicopters

MV-22 (Osprey): The MV-22 is projected to achieve operational status in early 1992, providing the Marine Corps with an advanced tilt-rotor aircraft capable of high-speed and long-range assault operations. The Navy will procure the first 12 Ospreys for the Marine Corps in FY 1990, with the goal of fielding an all-MV-22 medium-lift transport force by FY 2001. We have decided against competitive production for this aircraft, but are investigating alternate means to contain the program cost. We believe some efficiencies will result from the team approach to production as the Bell and Boeing companies join in manufacturing the aircraft.

CH-53E (Super Stallion): Procurement of CH-53s will terminate in FY 1990 with the purchase of three aircraft, leaving the Marine Corps with only about four squadrons' worth of heavy-lift assets. The decision to end production after FY 1990 was made only after careful consideration of Marine Corps heavy-lift requirements and the need to fund other, higher-priority programs.

AH-1W (Super Cobra): The AH-1W is replacing the Marines' older AH-1J/T aircraft on a one-for-one basis in the active force. Forty-four new-production AH-1Ws are already in service, and 34 more are scheduled for delivery through FY 1991. Additionally, 37 existing AH-1Ts will be converted to the more capable AH-1W configuration. The upgraded version is capable of firing a variety of weapons, including Tow, Hellfire, Sidewinder, and Sidearm missiles.

(3) Air Defense

Forward-Area Air Defense System (FAADS): The FAADS is a family of systems intended to modernize our divisional air defenses. Its components include a line-of-sight forward-heavy (LOS-F-H) system; a line-of-sight rear system; the pedestal-mounted Stinger (PMS) missile; a non-line-of-sight missile, the FOG-M; an automated command, control, and intelligence system; and improvements in the antiair capabilities of the Bradley fighting vehicle, M1 tank, and AH-64 attack helicopter. Since the FAADS program was launched in 1986, there has been steady progress in developing, testing, and implementing its various elements. PMS procurement began in FY 1987, the LOS-F-H will enter procurement in FY 1989, and FOG-M procurement will begin in FY 1991.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
AH-64 Apache				
Procurement:				
Quantity	77	72	72	72
$ Millions	850.3	1,014.1	899.6	847.1
OH-58D AHIP				
Procurement:				
$ Millions	158.7	211.6	299.1	327.9
LHX Light Helicopter				
Development:				
$ Millions	29.6	123.9	240.7	446.6
AH-64 MSIP				
Development:				
$ Millions	28.7	49.5	84.3	61.0
UH-60 Blackhawk				
Procurement:				
Quantity	72	72	72	72
$ Millions	492.4	468.5	412.8	468.9
CH-47D Chinook				
Procurement:				
$ Millions	244.5	248.1	326.6	259.9
AH-1W				
Procurement:				
Quantity	34	-	-	-
$ Millions	241.4	55.8	-	-
MV-22 Osprey				
Development:				
$ Millions	463.0	302.9	221.2	178.1
Procurement:				
Quantity	-	-	12	24
$ Millions	-	333.9	1,418.6	1,726.6
CH/MH-53E				
Procurement:				
Quantity	14	14	3	-
$ Millions	250.5	235.5	64.1	0.8

Stinger: The Stinger is a man-portable, shoulder-fired air defense missile that uses passive infrared homing to guide its warhead to its target. The basic system has been improved with an upgraded seeker that provides countermeasures protection and permits modifications to overcome future threats. The Stinger will remain our primary antiair system for divisional air defense until FAADS is fully fielded.

Chaparral: Chaparral is a self-propelled, short-range air defense system consisting of a tracked carrier, a launch station, and four ready-to-fire and eight stored missiles. A derivative of the Navy Sidewinder, this lightweight missile is able to travel at supersonic speeds and incorporates passive infrared homing and fire-and-forget capabilities. Improved versions feature a new guidance system, identification friend-or-foe (IFF) capabilities, night-vision/reduced-visibility enhancements, and a new smokeless motor. Research continues on other modifications to enhance performance and reliability. As FAADS is fielded, Chaparral will be moved from the division level to become part of corps air defense brigades.

Hawk: This medium-range, low-to-medium altitude, all-weather missile is used by the Army and Marine Corps to defend division and corps assets and support amphibious, base defense, and special tactical

operations. The system has benefited from several extensive product improvement programs (PIPs) over the years. The latest version (PIP III), to be fielded with Army and Marine forces in FY 1989, will provide a low-altitude, simultaneous-engagement capability and incorporate enhanced electronic counter-countermeasures. Hawk PIP III procurement will continue through FY 1992.

Patriot: The Patriot is the Army's most advanced long-range, surface-to-air missile system. It is capable of simultaneous engagements of multiple targets in severe electronic countermeasures environments. Patriot attained an initial self-defense capability against tactical missiles in July 1988. An ongoing product improvement program will maintain its effectiveness well into the future. The Netherlands and Germany are participating in Patriot acquisition programs to provide for cooperative air defense improvements, and Italy will soon follow. Additionally, Japan has been licensed to produce 26 fire units.

(4) Artillery Fire Support

We have taken a number of steps over the past eight years to improve the ability of our forces to detect advancing enemy formations and mass large volumes of accurate, effective firepower against them. To that end, we are upgrading the target-acquisition and fire-control capabilities of our fire-support systems, developing new munitions and weapon systems, and increasing the overall survivability of our fire-support forces on the battlefield.

Target Acquisition: The Army is working on two new systems that will provide long-range targeting support for its missile and artillery batteries. The Joint Surveillance and Target Attack Radar System (JSTARS) will be able to locate and track moving targets at extended ranges. The improved Firefinder II countermortar/counterbattery radar will offer enhanced survivability and mobility, a self-locating capability, and vastly improved target-processing capabilities. This system will significantly improve our ability to locate enemy artillery and mortars, allowing our forces to neutralize these units quickly.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
FAADS				
Development:				
$ Millions	249.4	284.5	231.3	182.8
Procurement:				
$ Millions	97.6	206.8	634.3	766.7
Stinger				
Development:				
$ Millions	8.9	-	-	-
Procurement:				
Quantity	6,167	9,865	4,754	7,203
$ Millions	259.3	382.4	187.5	280.1
Hawk				
Development:				
$ Millions	10.9	15.9	11.8	9.0
Procurement:				
Quantity	525	467	358	358
$ Millions	134.4	132.2	55.4	48.5
Patriot				
Development:				
$ Millions	18.3	22.6	39.2	29.2
Procurement:				
Quantity	715	815	815	817
$ Millions	917.6	844.9	971.6	860.3

Fire Control: The Advanced Field Artillery Tactical Data System (AFATDS) is a new-generation automated fire control system designed to increase the efficiency and targeting capacity of all available means of indirect ground fire support. It is being developed for use by Army field artillery units. Meanwhile, the Congress has directed procurement of the light tactical fire direction (LTACFIRE) system for the Army's light divisions, the 82nd Airborne Division, and the 101st Air Assault Division.

Weapons and Support Systems: The Multiple-Launch Rocket System (MLRS) is a high-rate-of-fire weapon assigned to general-support artillery units. It can be used to supplement cannon artillery fire or to strike targets, such as enemy artillery and air defense systems, beyond cannon range. A single launcher can fire its load of 12 rockets in less than a minute, covering an area the size of six football fields with approximately 7,700 grenade-like submunitions effective against both personnel and lightly armored targets. The Army began deploying the MLRS in FY 1983 and is

using multiyear procurement authority for its continued production. At the same time, as part of a multinational program with Germany, Italy, France, and Great Britain, it is working on a warhead for the system that will be able to dispense terminally guided submunitions against enemy tanks. Additionally, the Army plans to adapt the Tacit Rainbow cruise missile so that it can be fired from MLRS launchers. The Tacit Rainbow is designed to attack and destroy radar systems at antiaircraft missile sites. For the future, the Army is developing a binary chemical warhead for the MLRS.

The Army and Marine Corps will continue modernizing other fire support systems. The Army has reinstated the 120mm mortar system to replace its World War II-era 4.2-inch mortars. The FY 1990-91 budget seeks continued funding for the Howitzer Improvement Program, under which the Army is upgrading its self-propelled M109s to improve their responsiveness, durability, and survivability. The budget also continues procurement of the towed M119 105mm howitzer for the Army's light infantry divisions.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
MLRS				
Development:				
$ Millions	30.6	69.8	78.6	53.6
Procurement:				
Quantity	72,000	48,000	24,000	24,000
$ Millions	418.6	445.7	336.2	326.2
M119 105mm Howitzer				
Procurement:				
Quantity	76	88	75	79
$ Millions	40.7	33.2	24.7	25.8
120mm Mortar				
Development:				
$ Millions	3.2	7.3	-	-
Procurement:				
Quantity	-	49	167	188
$ Millions	-	5.0	11.4	12.5
120mm Mortar Ammunition				
Procurement:				
Quantity	19,000	58,000	-	172,000
$ Millions	6.5	33.5	-	60.5
155mm Howitzer Improvement Program				
Development:				
$ Millions	34.0	24.4	10.7	3.7
Procurement:				
$ Millions	14.1	26.2	76.7	180.7

Ammunition: The Army and the Marine Corps are continuing to build their inventories of improved longer-range conventional artillery munitions. A large number of these items have been earmarked for the war reserve stocks. Under development by the Army is a new fire-and-forget munition, called the Sense and Destroy Armor Munition (SADARM), designed to attack lightly armored targets from above. This munition will be fired from 155mm howitzers and the MLRS.

(5) Deep Operations

The AirLand Battle doctrine describes the Army's approach to generating and applying combat power at the operational and tactical levels. It is premised on securing and retaining the initiative in battle and exercising it aggressively to accomplish force missions. The AirLand Battle commander must synchronize close, deep, and rear operations to ensure success. Deep follow-on operations are conducted to disrupt the movement of enemy forces and supplies as well as enemy command and control functions, to create the conditions for successful battle at the front lines. The AirLand Battle doctrine advocates the use of all available assets for such operations. Special operations forces and related assets can play a critical role in such operations. This requires close coordination between the Army and other U.S. and allied forces, and the employment of coordinated systems for detecting, identifying, and engaging distant targets. Significant advances have been made in achieving these capabilities.

Work in the area of target acquisition and identification has focused on developing sensors for detecting and identifying distant targets, and automated systems for distributing targeting information to field commanders. Complementing these initiatives are new fire-support systems, such as the MLRS, and advanced weaponry, such as the Army Tactical Missile System, that will significantly enhance our ability to engage enemy forces deep in rear areas. Highlights of the program include:

Joint Surveillance and Target Attack Radar System (JSTARS): This airborne detection system, being developed jointly by the Army and the Air Force, is designed to monitor and assist our forces in attacking moving targets well before they reach the main battlefield. Drawing on the information it provides, our forces will be able to use their advanced weapon systems to attack targets deep behind enemy lines.

All-Source Analysis System (ASAS): This tactically deployable automated data processing (ADP) system is designed to receive and correlate data from strategic and tactical sources, develop intelligence and targeting information, and disseminate critical information rapidly. Operating in conjunction with its Air Force counterpart, the Enemy Situation Correlation Element, ASAS will provide ground and air commanders a common view of the deep battle, thus facilitating the combat decisionmaking process and adding depth to the commanders' view of the battlefield.

Army Tactical Missile System (ATACMS): This new missile, to be fired from MLRS launchers, will be able to dispense submunitions against targets deep behind enemy lines. Designed to exploit the long-range vision of our new target acquisition and guidance systems, ATACMS will be used to attack enemy follow-on forces, air defense systems, tactical ballistic missile launchers, and command and control facilities. Live-fire tests of the system began last year and have produced encouraging results.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
JSTARS Development:				
$ Millions	355.3	258.8	179.8	92.5
ASAS Procurement:				
$ Millions	34.6	23.1	71.4	56.2
ATACMS Development:				
$ Millions	100.2	76.0	46.8	-
Procurement:				
Quantity	-	66	276	452
$ Millions	9.1	70.7	140.9	188.9

(6) Combat Service Support

Combat service support provides equipment and services for the logistical resupply, maintenance, medical care, and feeding of our front-line forces. The systems providing this support range from tactical vehicles, expeditionary soft shelters, and protective clothing to medical, fuel-storage, water-purification, and cargo-handling equipment and containers. We continue to improve our capabilities in these less glamorous, but vitally important support areas, although in some cases fiscal constraints have slowed the rate of progress relative to previous plans.

A good example of the improvements we are making in combat service support is provided by the Army's new palletized loading system (PLS). The PLS is a heavy truck with a self-loading and unloading capability. Flat racks with a 16.5-ton payload can be loaded and unloaded in minutes by the vehicle driver. The Army will use the PLS primarily in its ammunition distribution system, where it will speed the flow of munitions to combat units and permit the dispersion of supplies to reduce vulnerability to enemy attack. Procurement of the system will begin in FY 1990.

(7) Tactical Command, Control, and Communications

The Army Tactical Command and Control System (ATCCS) is an integrated system of computers and communications equipment designed to help tactical commanders plan and control operations and coordinate them with other commands. It will link functional-area command and control (C^2) systems, allowing commanders to receive, in near real time, critical information with which to develop and execute battle plans. This includes enemy and friendly situation reports, intelligence and terrain data, and weather information. The system partitions tactical battlefield operations into five functional areas -- maneuver, fire support, air defense, intelligence/electronic warfare, and combat service support -- each of which is serviced by a designated C^2 component. ATCCS will define the overall architecture and tie the components together. Information will be exchanged over a common-user switched system (telephone), a combat radio network, and the Army Data Distribution System (data link).

(a) Tactical Command and Control

Maneuver Control System (MCS): The MCS will provide automated command and control support for maneuver forces. It will use distributed data bases and

processing to produce accurate and timely text and graphics displays and on-line combat operations analyses. The system consists of militarily adapted and commercial computer work stations configured to support a corps and its subordinate units.

Forward-Area Air Defense Command and Control (FAAD-C^2): This new automated system, a part of the FAAD family, is designed to provide C^2 support for air defense operations against low-altitude threats beyond a division's area of operation. Consisting of a network of transportable, portable, and handheld computers and terminals, it will collect, analyze, and distribute mission-critical data to battlefield commanders. It will be linked to joint air defense C^2 systems. The ground-based sensor will provide real-time data to the system.

Army Field Artillery Tactical Data System (AF-ATDS): AFATDS will automate the planning, coordination, and execution of fire support operations. It will consist of "smart" terminals, control station terminals, printers, and display devices interconnected by a local area network. Processing centers will keep and make available a distributed data base for directing fire in support of ground forces. An important new feature of AFATDS is its capability for dynamic reconfiguration. Through commonality of hardware and software functions, the system will permit an orderly decoupling of damaged terminals, the quick purging of corrupted data, and efficient setup of "work-arounds" for incapacitated functions.

Combat Service Support Control System (CSSCS): This new automated C^2 system will assist commanders in managing the full range of combat service support functions. It will consist of commercial computers adapted for tactical use and will have common ATCCS software. The system will be fielded from the brigade level up.

(b) Tactical Communications

Single Channel Ground and Airborne Radio System (SINCGARS): This new family of VHF-FM combat radios will serve as the Army's primary voice command and control system. SINCGARS radios are designed to transmit and receive voice communications and tactical data and to record messages. The system will be able to operate on any of 2,320 channels and will be hardened against nuclear effects. Communications security will be enhanced through the use of devices that allow the system to be operated in electronic warfare environments. The ground version of SINCGARS will be used to replace standard manpack and vehicle-mounted radios, while the airborne version will replace standard aircraft radios.

Army Data Distribution System (ADDS): ADDS will provide automated position reporting as well as near-real-time, secure, jam-resistant data communications. Its high-speed data transfer rates will allow weapons and control centers to send and receive information in support of tactical operations. The system will be deployed at the division level and will consist of various components, the key one being a net control station. There will be four such stations in each division area, serving as "control" points. These, together with up to 850 user units, will allow tactical units to identify their locations and the locations of other units.

4. Conclusion

The FY 1990-91 budget provides for continued increases in the combat strength of the Army and Marine Corps. Modernization programs will provide our land forces with new and better equipment, while sustainability improvements will enhance the forces' staying power. Rigorous training will ensure that the forces maintain a high degree of readiness. Most important, we expect to continue to attract and retain high-quality soldiers and Marines. Together, these programs will ensure that our land forces maintain the capabilities needed to provide a strong global deterrent and respond quickly and effectively to threats to U.S. interests worldwide.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
FAAD-C²				
Development:				
$ Millions	91.2	91.2	71.7	75.6
Procurement:				
$ Millions	-	-	48.2	150.5
ADDS				
Development:				
$ Millions	28.0	19.8	19.4	13.1
Procurement:				
$ Millions	102.0	75.5	55.6	235.4
MCS				
Development:				
$ Millions	14.0	11.9	7.4	20.2
Procurement:				
$ Millions	87.6	9.6	13.9	-
SINCGARS				
Development:				
$ Millions	15.3	9.3	11.9	1.4
Procurement:				
$ Millions	23.2	239.0	319.5	319.8
AFATDS				
Development:				
$ Millions	14.8	15.6	37.5	39.3
Procurement:				
$ Millions	28.9	-	7.4	16.4
CSSCS				
Development:				
$ Millions	1.2	1.4	6.3	8.1
Procurement:				
$ Millions	-	-	1.0	0.3
MSE				
Procurement:				
$ Millions	1,019.8	991.1	984.7	345.6

B. NAVAL FORCES

1. Introduction

The United States needs a strong navy to meet its commitments to a global alliance system and to deter the growing challenges posed by Soviet maritime forces and Third World countries. These commitments and challenges drive our naval force planning and dictate the need for certain essential warfighting capabilities. We must have sufficient, ready, and sustainable forces capable of operating effectively across the spectrum of potential requirements. These range from forces routinely deployed to forward areas in peacetime, to crisis-management forces sent to trouble spots to deter aggression, to fully mobilized forces capable of undertaking the full range of maritime missions should deterrence fail.

Of primary importance is our ability to operate effectively in forward areas against determined Soviet opposition. We believe that our prospects of terminating a major conflict on terms favorable to the West are improved if we can force the Soviets to fight from a defensive posture. Toward that end, our maritime strategy emphasizes offensive operations employing qualitatively superior forces.

Ten years ago, the Navy would have been hard-pressed to meet these challenges. The number of ships had declined between 1968 and 1978 by more than 50 percent, while overall tonnage had decreased by about 20 percent. The carrier force, including eight units outfitted for antisubmarine warfare (ASW) missions, had shrunk from 24 to 13 vessels, while aggregate deck space had declined by about 25 percent. We had compensated for these reductions through qualitative improvements in aircraft design, through nuclear propulsion, and by transferring the ASW capabilities of retiring ships to the remaining large-deck carriers.

Along with the reductions in ships, funding for the readiness and personnel accounts had dropped below prudent levels, resulting in dangerously low levels of force readiness. Clearly, an influx of funds was needed to continue the force expansion started in 1978 and to provide sufficient levels of readiness and sustainability to meet an expanding threat.

As our capabilities diminished, our overseas commitments increased, especially in the Persian Gulf area. By 1980, it was clear that the Navy was stretched too thin to meet all of the requirements of a global defense strategy. The credibility of our deterrent posture had seriously eroded, and even peacetime commitments were overburdening our naval personnel to the point that they were leaving the Navy at a dangerously high rate. The Navy's senior leadership concluded that, in wartime, we would face an unacceptably high risk in performing combat missions, particularly in light of the Soviets' continuing efforts to strengthen their fleet.

Today, arrayed against our forces at sea is an increasingly sophisticated Soviet arsenal of weapons capable of being launched from bombers, submarines, and surface ships. These weapons pose a growing threat to our forces over an expanding portion of the world's oceans. In spite of Soviet rhetoric that asserts the contrary, we see no significant changes in the Soviet maritime threat that would suggest a need for any major restructuring of our goals and mission requirements.

2. Force Structure and Composition

Over the past eight years, we have made considerable progress in building a larger, more modern fleet. At the end of FY 1988, the Navy's deployable battle force stood at 565 ships, up from 479 at the end of FY 1980. Table III.B.1 tracks the changes in the force structure by major categories of ships, and shows our long-term goals for the various categories.

The table reflects a change in the goal for surface combatants. The new goal, driven by changes in the threat, calls for building 120 multimission (battle-force-capable) ships. This new ship category combines the two previous categories of antiair warfare (AAW) cruiser/destroyers and ASW destroyers. Note that 31 of the 109 battle force combatants listed for FY 1990 are Spruance-class ASW destroyers. These ships will be assigned as battle force combatants while the Navy builds toward its multimission ship goal. Also note that the frigate category has been renamed "protection of shipping ships". Together, the forces reflected in this table support the illustrative wartime naval fleet dispositions depicted in Chart III.B.1.

Our goals for aircraft carriers and battleships will be achieved in FY 1990, but fiscal constraints and emerging delays in ship deliveries will frustrate achievement of other goals. The reasons for this are addressed in subsequent sections.

3. The 600-Ship Navy

In last year's report, we indicated that the early retirement of 16 older frigates would result in deferral of the 600-ship goal. These retirements, along with tightened fiscal constraints, uncertainty about future shipbuilding rates, and emerging delays in ship deliveries, will postpone achievement of the goal beyond the

Naval Force Structure Changes

Table III.B.1

	Force Level				
	FY 1980	FY 1988	FY 1989	FY 1990	Goal
SSBNs	40	37	36	35	20-40
Deployable Aircraft Carriers	13	14	14	15	15
Battleships	0	3	4	4	4
Battle Force Combatants	63	75	77	78	120
ASW Destroyers	44	32	31	31	--
Protection of Shipping Ships	71	107	100	100	104
Attack Submarines	79	100	100	97	100
Mine Countermeasures Ships	3	4	3	8	14
Amphibious Ships (MEF & MEB)	66	63	66	66	75
Patrol Combatants	3	6	6	6	6
Combat Logistics Ships	48	58	60	60	65
Support Ships and Auxiliaries	49	66	71	74	60-65
Total	**479**	**565**	**568**	**574**	**583-608**

turn of the century. In light of the Navy's maritime strategy and current global commitments, however, the requirement for the 600-ship Navy remains valid. Since there is no mathematical formula for determining "optimal" force structures, we believe that in a fiscally constrained environment, attention should focus on maintaining a balanced, fully supported force rather than attempting to achieve one that is larger, but potentially hollow. Our current projections show that the overall number of ships in the deployable battle force category will vary between about 570 and 590 for the next eight years.

Fiscal constraints continue to preclude the achievement of even the Navy's reduced surface-combatant force objective of 224 ships, as depicted in Table III.B.2. Considerable improvements in the warfighting capabilities of the surface fleet have nonetheless been attained during this decade. This is exemplified by the deployment of CG-47 cruisers and continued construction of DDG-51 destroyers, which add increased capability in all warfare areas. Specifically, the SQQ-89 sonar system carried by these ships greatly improves ASW capability, while their vertical launch systems increase firepower in all warfare areas. We have made procurement of these multimission ships a high priority, and a total of 35 have now been authorized for construction.

In spite of the current fiscal environment, the program goals we established eight years ago remain essentially unchanged. In general, our primary objectives are to:

- Sustain a fully supported, balanced fleet with an appropriate mix of ships and aircraft;

- Continue to seek maximum efficiency through competitive strategies and refined tactics;

- Maintain high levels of readiness; and

- Improve sustainability, especially in the area of munitions.

4. Readiness and Sustainability

a. Readiness

Our naval forces are operating at a high state of readiness. Over the past eight years, there have been significant improvements in manpower, training, equipment, and supplies. The FY 1990-91 budget is structured to preserve these hard-won gains in the years ahead.

Wartime Disposition of U.S. Naval Fleets

Chart III.B.1

3rd Fleet Eastern Pacific
2
1

2nd Fleet Atlantic
4
1
3

6th Fleet Mediterranean
4
1
2

7th Fleet Western Pacific and Indian Ocean
5
2
4

LEGEND

— Carrier Battle Group

— Battleship Surface Action Group

— Underway Replenishment Group
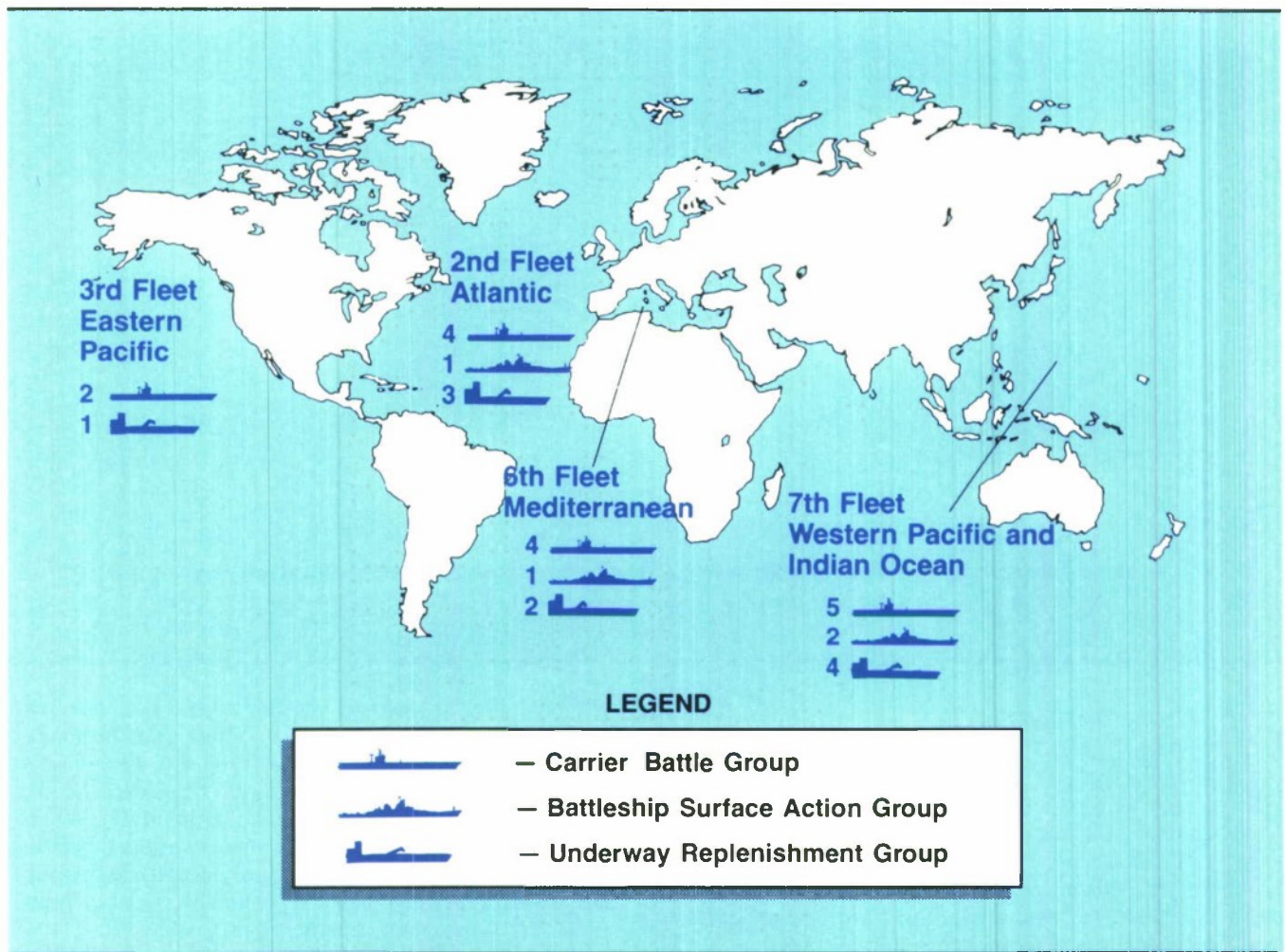
Since FY 1980, the percentage of materially ready ships in the surface fleet has increased from about 50 percent to more than 75 percent. Large increases in funding for naval readiness programs, combined with management improvements, have contributed to this gain. For example, the Navy was able to reduce its backlog of ships awaiting overhaul from 16 in FY 1980 to zero in 1986 and 1987. Additionally, it increased the time between major ship overhauls by substituting shorter, but more frequent repair periods and by increasing the productivity of naval shipyards. Furthermore, in 1981, the Navy consolidated its spare parts program for ships under the management of a stock fund. In 1985, it initiated a "Buy Our Spares Smarter" program, which has reduced costs by increasing competition among suppliers. Today, virtually all of our ship forces have adequate stocks of repair parts.

Unfortunately, the progress in these areas has not continued in the overhaul program. Since 1987, the Navy has had to defer major overhauls for four ships due to a lack of funds. That trend is projected to continue at least for the next few years, with the number of ships awaiting overhaul rising to five by FY 1991.

In FY 1990, the Navy will continue to operate its ships at a high tempo. The budget supports 50.5 steaming days per quarter for the forward-deployed fleets (the Sixth and Seventh) and 29 days for the "home" fleets (the Second and Third). The fleets will enhance their readiness through robust levels of training and through exercising regularly with the other Services and with our allies.

Surface-Combatant Force Level Objectives

Table III.B.2

Major Force Element	Battle Force Combatants	Protection of Shipping Ships	Total
15 Carrier Battle Groups	90	—	90
4 Battleship Surface Action Groups	16	—	16
1.5 Marine Expeditionary Force (MEF & MEB)	14	8	22
7 Convoys	—	56	56
10 Underway Replenishment Groups	—	40	40
Total	**120**	**104**	**224**

b. Sustainability

The Navy has largely completed building its stocks of war reserve spares for its ships and has also markedly improved its stockpile of munitions. As shown in Chart III.B.2, in FY 1988 the constant-dollar value of stocks of torpedoes, cruise missiles, and surface-to-air missiles was over one-and-a-half times that of the FY 1980 inventory. If our full request for FY 1990-91 is enacted, we project that the FY 1992 stockpile will represent an investment of over twice the constant-dollar value of the FY 1980 ordnance inventory.

5. FY 1990-94 Programs

The following sections describe the four broad categories of naval force programs we are proposing for FY 1990-94.

a. Power Projection

(1) Aircraft Carriers

With the delivery of our fifteenth deployable carrier (CVN-72) in FY 1990, we will have increased aggregate carrier deck space by about 17 percent since 1978. Over those same years, the fraction of the force with nuclear propulsion will have risen from 23 to 40 percent. The accelerated procurement of nuclear carriers (CVNs) resulting from congressional authorization of CVNs 74 and 75 in FY 1988 will permit us to retire the Midway and the first of the Forrestal-class carriers earlier than expected. The large number of carriers scheduled for refueling and overhaul between 1991 and 1995, however, will in effect reduce the number of carriers that are readily available to meet peacetime and crisis commitments.

(2) Battleships

Our battleship reactivation program culminated last year with the recommissioning of the Wisconsin in October. This brought to four the number of Iowa-class battleships that have been refurbished and returned to service with the fleet. Armed with Tomahawk and Harpoon cruise missiles and carrying 16-inch guns, these ships have significantly enhanced our ability to perform the important wartime missions of power projection and gunfire support.

(3) Cruise Missile Forces

We are continuing to introduce cruise missiles that will improve the land-attack and antiship capabilities of our naval forces.

Value of Navy Ordnance Inventories
(Base Year FY 1980)

Chart III.B.2
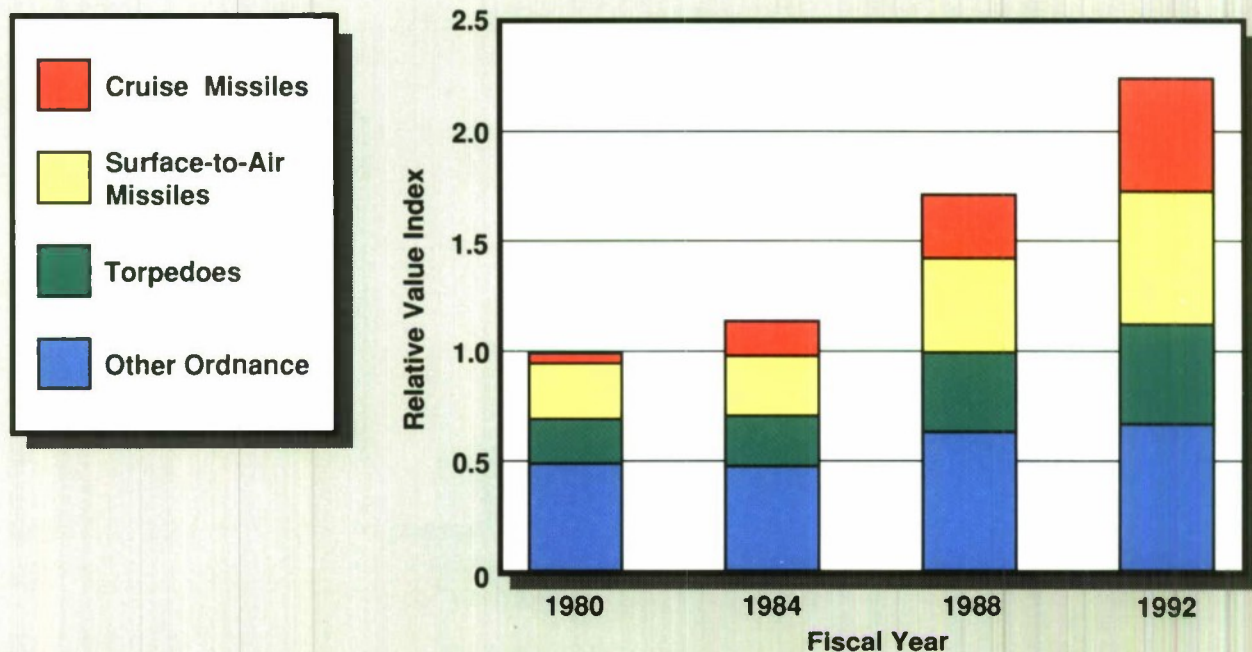
Tomahawk: The flight test program of this land-attack missile continues to be successful. Nearly one-quarter of the surface combatants and attack submarines in the fleet are equipped to employ the Tomahawk. The first deployments of the missile in a vertical launch system took place in late FY 1988 on an SSN-688-class submarine. Tomahawks are being deployed in increasing number throughout the fleet and are ready for use in any theater.

Harpoon: The Harpoon remains the fleet's proven system for engaging enemy surface forces at standoff ranges. The Navy is developing a variant of the Harpoon known as the Standoff Land-Attack Missile (SLAM) that will allow aircraft to attack land targets.

(4) Amphibious Assault Forces

Marine air-ground task forces (MAGTFs) provide rapidly employable amphibious assault capabilities for crisis operations worldwide. New construction programs for our lift forces will help to compensate for the planned retirement of large numbers of aging amphibious ships near the turn of the century. Our goal, established at the beginning of the decade, is to acquire sufficient lift capacity to accommodate the assault echelons of a Marine Expeditionary Force (MEF) and a Marine Expeditionary Brigade (MEB). Lift capacity is expected to increase from 71 percent of the require-

ment in FY 1980 to 81 percent in FY 1989. The FY 1990-94 program will essentially achieve the MEF-plus-MEB objective by the end of FY 1998, if the retirement dates of existing ships remain as projected. Block obsolescence of aging ships will make this a difficult capability to sustain over the longer term, however.

The amphibious assault force is not only expanding, it is also utilizing over-the-horizon capabilities in ship-to-shore movement brought about by new amphibious warfare tactics and doctrine. This new strategy offers flexibility and maneuverability, while reducing the vulnerability of our ships to hostile fire from ashore. Chart III.B.3 illustrates the improvement trend in ship-to-shore capability.

The LHD-1, the LSD-41 and its cargo variant, and the landing craft air-cushioned (LCAC) are fundamental to our amphibious lift capabilities and strategy.

LHD-1: At approximately 40,000 tons, the LHD-1 is one of the largest amphibious ships ever built. Each of these vessels can accommodate almost 2,000 troops, along with 42 helicopters, three LCACs, and numerous cargo and assault vehicles. The lead ship in the program, the Wasp, was launched in 1987 and will be delivered to the Navy in early 1989. Three additional ships have been authorized by the Congress and are

Amphibious Ship-to-Shore Improvements

Chart III.B.3

Legend:
- LCM-8s [a]
- LCUs [b]
- LCACs

Cubic Foot-Miles Per Hour (Millions) [c]

End of Fiscal Year — 1980, 1990

[a] Landing craft, mechanized.
[b] Landing craft, utility.
[c] Determined by multiplying cubic foot-carrying capacity by knots per hour.
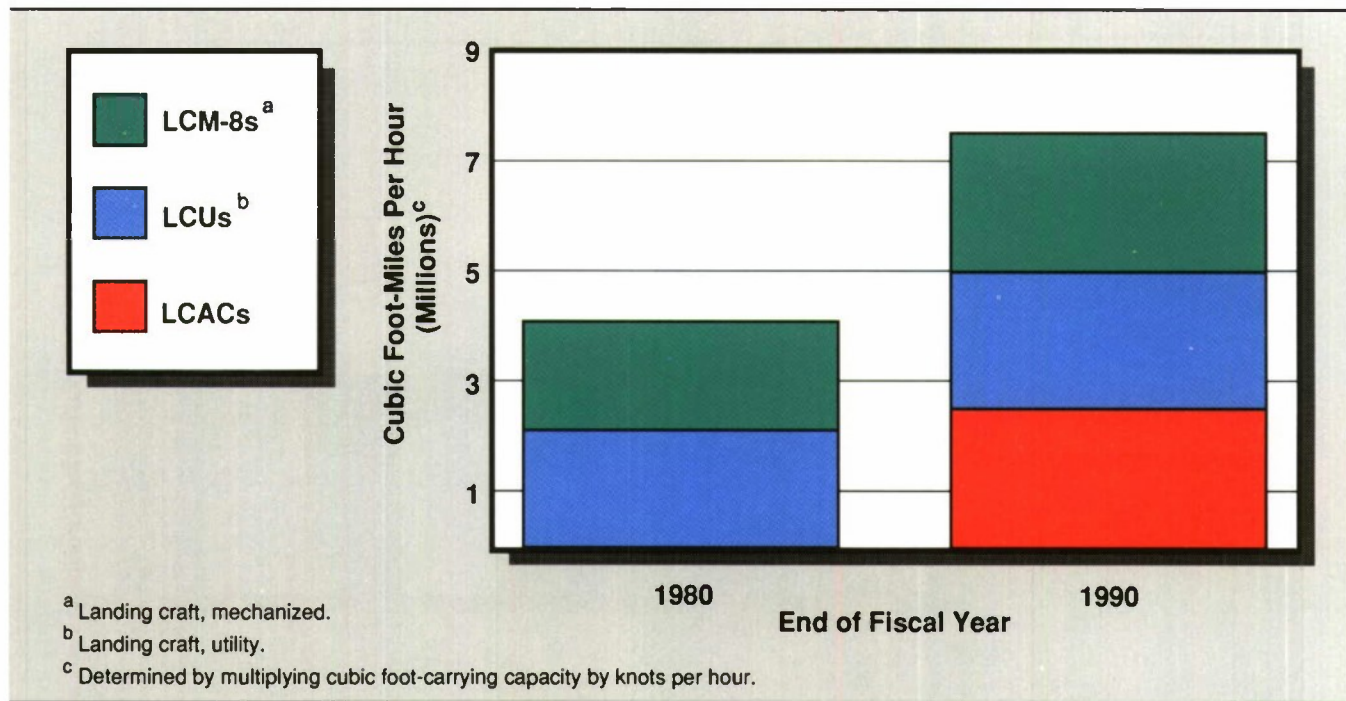
under contract. A fifth ship, which had been scheduled for purchase in FY 1991, has had to be deferred, however, due to budgetary pressures.

LSD-41 Cargo Variant (CV): The LSD-41 (CV) is designed to provide cargo space needed to achieve overall balance in lift capacity. Funds for the lead ship were authorized in FY 1988, and its delivery is expected in late 1993. The FY 1990-94 program calls for procurement of five additional ships at a rate of one per year.

LCAC: The LCAC will expand the over-the-horizon assault capabilities of our amphibious forces. It is designed to carry the combat and logistical vehicles of a Marine landing force. In order to meet the MEF-plus-MEB goal, we plan to acquire at least 90 of these craft over the next decade. The Navy has taken delivery of 15 to date. Deficiencies uncovered in performance and reliability tests, which halted production for two years, have now been corrected, allowing procurement to resume in FY 1989. The FY 1989-94 program calls for procurement of an average of 12 LCACs per year, which we consider to be an economic rate. The FY 1990 budget provides funds for nine craft, which,

when combined with the 15 funded in FY 1989, will achieve this rate. The FY 1991-94 program sustains production at the 12-craft-per-year rate.

b. Antiair Warfare Forces and Programs

Soviet tactical missiles pose a serious threat to our naval forces and to important sea lines of communication. Since these weapons can be launched from bombers, submarines, and surface ships, a wide variety of antiair systems are required to defeat them. Because the missiles are difficult to intercept, the most effective way to counter them is to engage the systems that carry them. In some cases, this may entail strikes against the bases from which bombers or naval vessels are employed. Land-based detection systems and interceptors provide another defense. While these longer-range "regional" and "outer zone" defenses provide a substantial layer of capability, we also must maintain strong "local" defenses in the immediate vicinity of naval task forces to protect against weapons that might penetrate more distant defense layers.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
CVN Aircraft Carrier Procurement:				
Quantity	2	-	-	-
$ Millions	6,237.0	15.1	51.3	15.8
CV Service Life Extension Program Procurement:				
Quantity	1	-	1	-
$ Millions	754.9	75.8	671.8	122.9
Tomahawk Missiles Procurement:				
Quantity	475	510	400	400
$ Millions	835.6	706.9	572.2	662.6
Harpoon Missiles Procurement:				
Quantity	109	119	190	184
$ Millions	141.7	167.2	224.2	237.5
LHD-1 Procurement:				
Quantity	1	1	-	-
$ Millions	765.5	757.9	5.3	54.9
LSD-41 Variant Procurement:				
Quantity	1	-	1	1
$ Millions	258.0	-	229.3	232.7
LCAC Procurement:				
Quantity	-	15	9	12
$ Millions	38.2	306.6	222.2	288.3

(1) Wide-Area Surveillance

Timely warning and detection capabilities can assist in maximizing the effectiveness of our defenses. This warning can come from a combination of sources -- Navy and Air Force systems, and other national means. The tactical Relocatable Over-the-Horizon Radar (ROTHR) system promises to increase substantially the amount of warning time available to U.S. maritime forces. The system will be positioned in strategically important regions of the world, and will provide wide-area coverage in locations not usually monitored. Initial operational capability will be achieved in FY 1989 at a site in Alaska, and full-scale production will begin in FY 1990.

(2) Broad-Area Interception

Given proper warning, a land- or carrier-based team of early warning aircraft, fighter-interceptors, and electronic warfare aircraft can detect and intercept approaching bombers before they come within missile-launch range. To supplement our aircraft systems, we are upgrading our ship-launched Standard missiles (SM-2) to enable them to intercept enemy bombers at longer ranges and higher altitudes. This will permit antiair warfare (AAW) surface combatants to contribute to broad-area air defense operations. The first flight test of the upgraded Standard missile is scheduled for FY 1990.

(3) Antiair Warfare Ships

Our wide-area surveillance and broad-area interceptor systems cannot guarantee a "leak-proof" air defense shield around carrier battle groups and other naval task forces, so we must also maintain a strong area missile defense capability. These systems are essential to protect naval forces from enemy missiles that survive our broad-area defenses, or that are launched

at relatively close ranges from undetected submarines. Two new classes of surface combatants, the CG-47 cruiser and the DDG-51 guided missile destroyer, are bolstering the warfighting capabilities of our naval battle groups, particularly in the area of antiair warfare. Both ship classes feature the Aegis weapon system, which incorporates advanced technologies for detecting and intercepting high-speed cruise missiles. The system's powerful phased-array radar can detect incoming missiles at long ranges, and its automated fire-control equipment can track and engage many targets simultaneously. The Aegis system, when combined with the Vertical Launch System (VLS) being installed aboard these ships, dramatically improves the fleet's air defense firepower. Chart III.B.4 shows the relative improvement in AAW firepower achieved by these ships since 1980.

CG-47: Funds for the last five of a planned force of 27 Ticonderoga-class cruisers were appropriated in FY 1988, and eleven ships are now operating with the fleet. CG-59 will be the first ship of the class to carry the upgraded AN/SPY-1 radar, which offers enhanced performance in a jamming environment. The ship will be commissioned in early FY 1989.

DDG-51: The first eight ships in the DDG-51 program have now been authorized for construction. Due to schedule delays, however, the lead ship (Arleigh Burke) will not be delivered until FY 1991, a slip of over 16 months relative to previous plans. The five-year program projects construction of 25 additional ships, including five in FY 1990. (This latter figure reflects an increase of one ship relative to last year's projection, made possible by the early completion of CG-47 procurement.) Nonetheless, this rate of construction will still barely keep pace with retirements of older AAW destroyers, which are now slated to begin in FY 1990. Based on our current objective of 120 battle force combatants, the fleet will remain short of these types of ships throughout the 1990s, as shown in Chart III.B.5.

(4) Antiair Warfare Weapons

The FY 1990 budget provides for continued increases in AAW weapons stocks. We expect that by the end of FY 1992, our on-hand stocks of these missiles (Standard, Rolling Airframe, Sea Sparrow, and Basic Point Defense Missiles) will be nearly triple the FY 1980 inventory, as Chart III.B.6 shows.

Surface Ship AAW Firepower Potential
(Base Year FY 1980)

Chart III.B.4
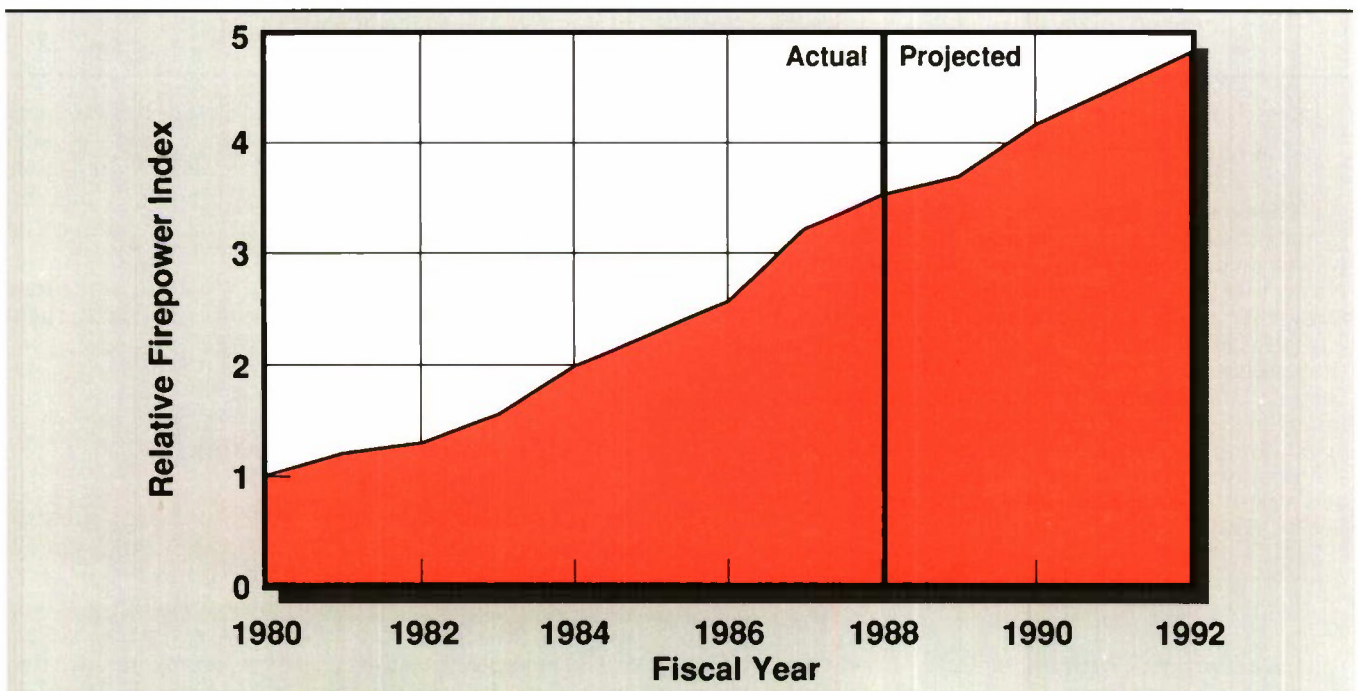
Status of Battle Force Combatants

Chart III.B.5
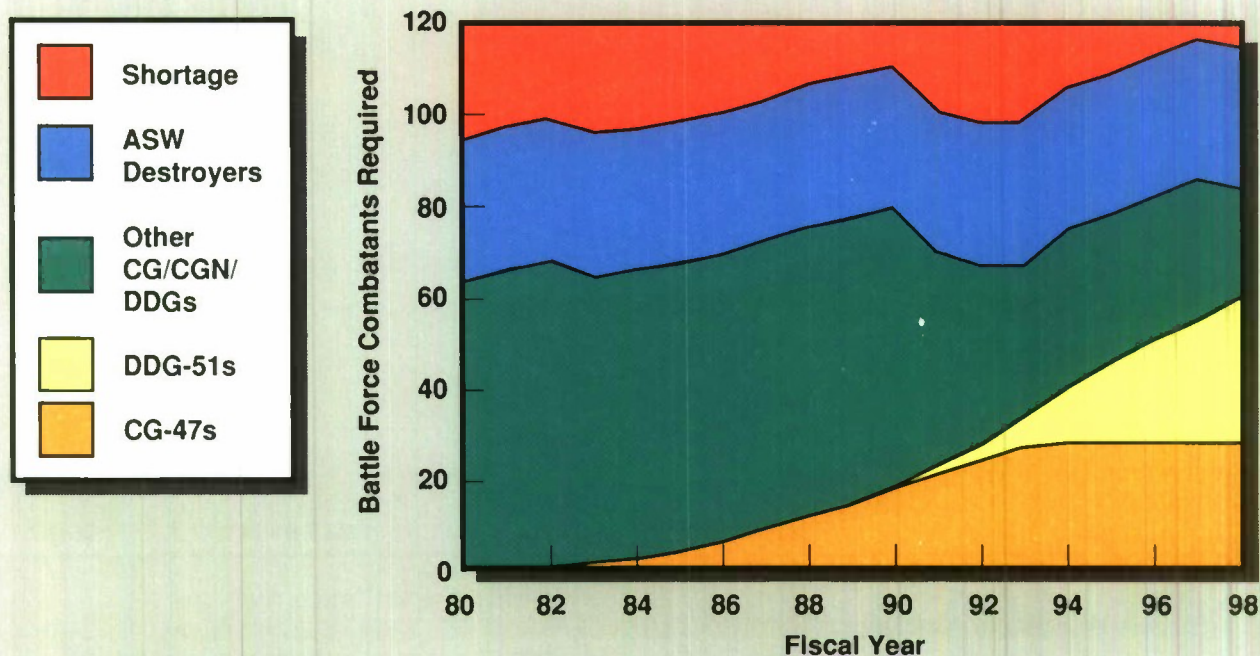
Surface-to-Air Missile Inventory Trend
(Base Year FY 1980)

Chart III.B.6
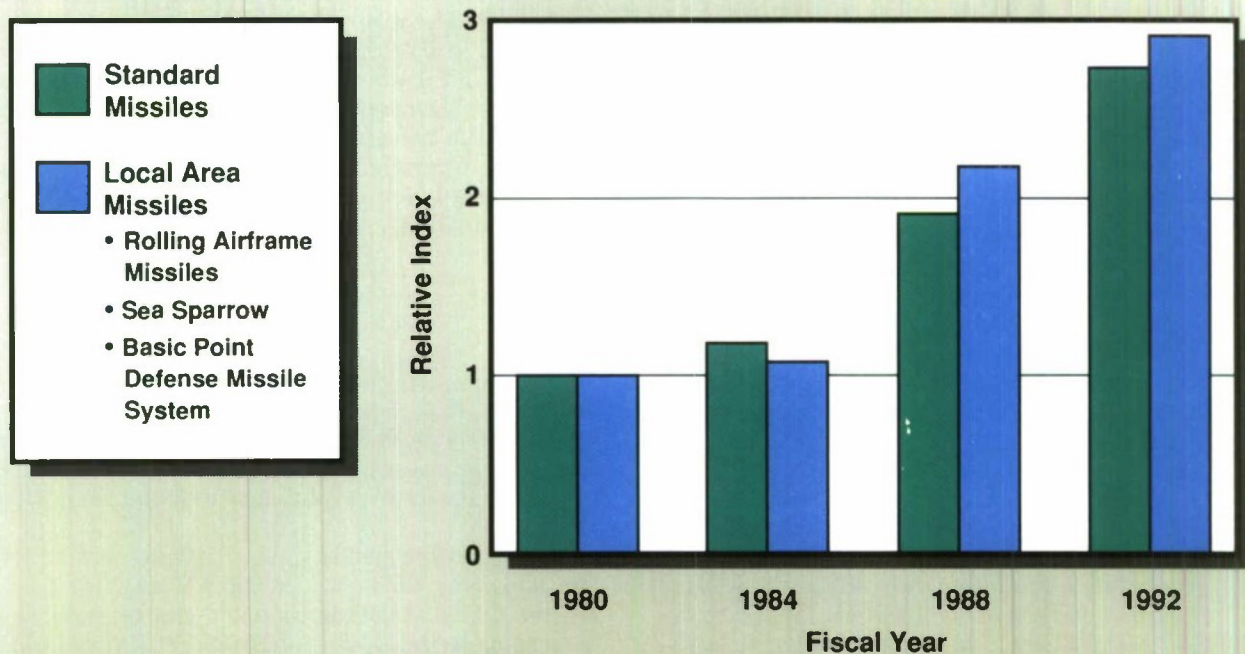
	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
ROTHR				
Development:				
$ Millions	26.7	9.7	19.9	11.0
Procurement:				
Quantity	1	2	1	1
$ Millions	88.1	161.3	86.6	79.6
CG-47 Cruiser				
Procurement:				
Quantity	5	-	-	-
$ Millions	4,182.8	80.1	85.9	77.0
DDG-51 Destroyer				
Procurement:				
Quantity	-	4	5	5
$ Millions	10.4	2,826.2	3,617.8	3,649.1
SM-2 Missiles				
Procurement:				
Quantity	1,310	1,310	590	900
$ Millions	561.3	586.6	316.8	566.7

(5) AAW System Testing

The Block I version of the Phalanx Close-In Weapon System (CIWS) recently completed its operational evaluation, demonstrating an improved ability to counter steep-diving antiship cruise missiles. Another new shipboard system, the Rolling Airframe Missile, is scheduled to undergo its operational evaluation in FY 1990. To enhance the realism of shipboard AAW systems tests, the Navy is introducing a supersonic low-altitude target (SLAT) that flies in excess of Mach 2 and at extremely low altitudes. This system will undergo operational testing in FY 1991.

c. Antisubmarine Warfare (ASW) Forces and Programs

The Navy's ASW master plan calls for a layered offensive strategy in which Soviet submarines are detected and engaged in forward areas and at geographic choke points, before they can threaten our forces or disrupt sea lines of communication. For such operations, we would rely primarily on attack submarines and maritime patrol aircraft supported by long-range surveillance systems. Layered defenses surrounding our naval task forces and convoys would contend with any enemy submarines that managed to escape these forward-area sweeps. These screens would be provided by surface combatants equipped with advanced sonars, ASW torpedoes and ASW helicopters, and carrier-based ASW patrol aircraft and dipping-sonar helicopters.

(1) Surveillance Systems

One of our most important and successful ongoing programs in this area is the TAGOS Surveillance Towed-Array Sonar System (SURTASS). TAGOS ships are being used to extend coverage into areas not routinely monitored by fixed systems and to provide backup capabilities in the event those systems become incapacitated. Twenty-two such ships have been authorized through FY 1989, and 11 have already joined the fleet. Funds for the lead ship of an improved-hull version of the class (SWATH TAGOS) were appropriated in FY 1987, and three additional units were funded in FY 1989. The six SWATH TAGOS vessels planned for procurement in FY 1990-94 represent a reduction from previous plans, but the ships will be considerably upgraded. For the future, the Navy is developing a militarized version of the SURTASS system, called AGOS. The first of these ships is scheduled for procurement in FY 1992.

(2) Attack Submarines

Our attack submarine force would be in the vanguard of initial engagements in any major naval campaign, operating in forward areas with little assistance from friendly forces. Such operations require stealth, quick and accurate weapons delivery, and firepower.

The Navy reached its goal of 100 attack submarines late last year, having added more than 20 units since FY 1980. Due to retirements of diesel submarines and delayed deliveries of new SSN-688s, the force level will drop to 97 in FY 1990. Continued production of SSNs

at a rate of three or four units per year will be needed if we are to restore the 100-ship level and maintain a qualitative edge over Soviet submarines.

SSN-688: The SSN-688 Los Angeles-class submarine remains the mainstay of our attack submarine force, with 39 of the 61 units authorized through FY 1989 now in service. Improved versions of the submarine feature a new combat system, new quieting equipment, an Arctic warfare capability, and improved sensors. The newest units are equipped with the Vertical Launch System (VLS), which adds significant Tomahawk-strike capability. Delays have developed in the delivery of SSN-688s currently under construction. SSN-750 is projected to be a year late, and 16 subsequent units will be delayed from one to 18 months. The primary reasons for these delays are design problems with the combat system, a decline in shipbuilder productivity, and overly optimistic construction schedules. The construction program for FY 1990-94 has been reduced from five to two units due to funding constraints. The last year of procurement has been accelerated to FY 1990 to allow more economical procurement of SSN-21 Seawolf-class submarines.

SSN-21: The SSN-21 Seawolf-class submarine will maintain the qualitative superiority of the U.S. attack submarine force into the next century. It will be quieter, deeper diving, and faster than its predecessors, and will provide robust ASW and strike capabilities. The Congress authorized construction of the lead ship in FY 1989, and a contract will be awarded early this year. We expect competition for the class to be brisk, with investments in modern construction facilities driving down the costs of follow-on units.

(3) ASW Weapons

MK-48: The MK-48 Advanced Capability (AD-CAP) torpedo successfully completed its operational tests and evaluation and was introduced into the fleet late last year. Full production is anticipated this year. Planned upgrades to the system will ensure that it remains effective against the threat well into the 21st century.

ASW Standoff Weapon: During the past year, we decided to combine the vertical-launch ASROC (VLA) and Sea Lance missile into a common standoff weapon incorporating the Sea Lance design. This decision will lead to a more capable ASW standoff weapon for the

surface and submarine forces that will meet both current and projected threats and be less costly to produce than two separate systems.

MK-50: This next-generation lightweight torpedo will allow air and surface platforms to combat projected submarine threats through the year 2000. Initial operational tests of the torpedo were completed early in FY 1989. Due to design problems, however, the system's introduction has been slipped to early 1991.

(4) Surface Ship ASW Systems

Surface Combatants: The Navy is enhancing its ASW capabilities by introducing an improved sonar system aboard its surface ships, including CG-47-class cruisers, DD-963- and DDG-51-class destroyers, and FFG-7-class frigates. The new system provides state-of-the-art area ASW coverage for battle force protection, giving these already capable AAW ships true multimission status.

ASW Helicopters: Operations in the Persian Gulf over the past year have proven the worth of the SH-60B LAMPS MK III helicopter system. These helicopters provided surveillance "eyes" for naval units involved in tanker escort missions and also participated in minehunting operations. The FY 1990 and 1991 budgets continue production of a mix of SH-60 B and F models, the latter of which is a "dipping sonar" variant. The Penguin antiship missile, to be backfitted onto some SH-60Bs, will enter production in FY 1990.

(5) Maritime Patrol Aircraft

The Navy plans to begin retiring large numbers of P-3A/B aircraft in the mid-1990s. These planes, which are operated in reserve patrol squadrons, are nearing the end of their useful service lives. Their engines and avionics equipment are increasingly difficult and costly to support, and their ASW capabilities are obsolete relative to the growing threat. The FY 1990-91 budget continues development of a follow-on system, called the Long-Range Air ASW Capability Aircraft (LRAACA). The LRAACA is designed to carry larger payloads than the existing P-3C and will be capable of performing ASW missions with both greater range and on-station operating time. We plan to begin producing the aircraft in FY 1992.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
TAGOS SURTASS Ships				
Procurement:				
Quantity	-	3	1	-
$ Millions	13.6	161.5	166.7	7.3
SSN-688				
Procurement:				
Quantity	3	2	2	-
$ Millions	1,714.7	1,410.2	1,636.0	83.2
SSN-21				
Procurement:				
Quantity	-	1	-	2
$ Millions				
MK-48 ADCAP				
Procurement:				
Quantity	100	320	320	320
$ Millions	243.4	481.1	500.7	412.1
ASW Standoff Weapon				
Development:				
$ Millions	105.1	79.3	127.8	139.9
MK-50 Torpedo				
Procurement:				
Quantity	10	140	200	270
$ Millions	108.4	197.4	280.2	344.3
SH-60B/F Helicopters				
Procurement:				
Quantity	24	24	24	24
$ Millions	468.9	492.5	512.1	430.4
LRAACA				
Development:				
$ Millions	1.3	65.8	205.1	231.6
Procurement:				
$ Millions	-	-	-	19.9

d. Mine Warfare Forces

Low cost and ease of deployment make mines a constant threat, both in coastal areas and in international waters, as events in the Persian Gulf over the past year made clear. Although we would expect our allies to perform the bulk of mine countermeasures operations in any major conflict, we still must maintain a capability of our own. The Navy is procuring several systems to perform mine countermeasures missions, the most important of which are MCM-1 and MHC-51 ships and the MH-53E helicopter.

MCM-1: Production of these ships has accelerated considerably, and we expect to take delivery of three more units by the end of this year. The FY 1990 budget supports procurement of the final three ships in the program, funding for which was denied by the Congress in FY 1988. After serving in the active fleet for about one year, the ships will be assigned to the Naval Reserve Force.

MHC-51: Construction of the first of these coastal minehunter ships began on schedule in May 1988, and the Congress approved funding for competitive procurement of the second and third ships in the program last year. The Navy plans to buy a total of 17 MHC-51s, all of which will be operated by the Naval Reserve Force.

MH-53E: The MH-53E Sea Dragon (along with its cargo counterpart, the CH-53E) is the largest helicopter in service outside the Soviet fleet. The seven helicopters

funded in the FY 1989 budget completed our planned MH-53E purchases. By the end of this year, the Navy expects to have accepted delivery of 25 MH-53Es.

e. Combat Logistics and Support Forces

Fast Combat Support Ships: Funds for the second ship of the AOE-6 class were appropriated in FY 1989, and follow-on ships are planned for procurement in each of the next five years. The AOE-6 is an all-purpose replenishment ship, capable of supplying the fleet with food, fuel, ammunition, and other provisions. We plan to build eleven of these vessels, raising our total inventory of fast combat support ships to 15, one for each deployable battle group.

Fleet Oilers: Five new TAO-187-class oilers have already been delivered to the fleet, and ten others have been authorized for construction. These ships, operated by the Military Sealift Command, shuttle fuel to battle groups from forward bases and consolidation points. They are replacing the 35-to-40-year-old vessels now performing this service.

Ammunition Ships: The AE-36 program will provide one-for-one replacements for our five AE-21-class ammunition ships, which were commissioned in the 1950s. The new ships feature gas-turbine propulsion and provide substantially more cargo-handling capability than their predecessors. Procurement of the first three ships is included in the five-year shipbuilding plan.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
MCM-1 Ships Procurement:				
Quantity	-	-	3	-
$ Millions	7.3	13.8	358.3	10.4
MHC-51 Ships Procurement:				
Quantity	-	2	3	3
$ Millions	-	197.7	234.0	227.1
MH-53E Helicopters Procurement:				
Quantity	8	7	-	-
$ Millions	151.3	145.0	23.8	-

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
AOE-6 Support Ships Procurement:				
Quantity	-	1	1	1
$ Millions	-	363.3	362.3	365.4
TAO-187 Oilers Procurement:				
Quantity	2	5	-	-
$ Millions	262.7	701.2	11.9	7.5

6. Conclusion

In spite of reductions mandated by fiscal realities, we have maintained a balanced program, with the overriding emphasis on maintaining a ready, sustainable force. Although we will not achieve the previous goal of 600 deployable battle force ships prior to the turn of the century, we already have met several force structure objectives. We will continue to make every effort, through competitive procurement and streamlined management, to extract maximum capability from our defense dollars and maintain a navy that is fully capable of defending vital U.S. interests at sea.

FY 1990 - 94 Shipbuilding Program

Table III.B.3

	FY 1990	FY 1991	FY 1992	FY 1993	FY 1994	FY90-94 Five-Year Total
New Construction						
Trident (Ballistic Missile Submarine)	1	1	1	1	1	5
SSN-688 (Attack Submarine)	2	0	0	0	0	2
SSN-21 (Attack Submarine)	0	2	3	3	3	11
DDG-51 (Guided Missile Destroyer)	5	5	5	5	5	25
LHD-1 (Amphibious Assault Ship)	0	0	1	1	0	2
LSD-41 (Landing Ship Dock - Cargo Variant)	1	1	1	1	1	5
MCM-1 (Mine Countermeasures Ship)	3	0	0	0	0	3
MHC-51 (Coastal Minehunter)	3	3	4	4	0	14
AGOS (Surveillance Ship)	0	0	1	0	2	3
TAGOS (Surveillance Ship)	1	0	2	1	2	6
AE-36 (Ammunition Ship)	0	0	0	1	2	3
AOE-6 (Fast Combat Support Ship)	1	1	1	1	1	5
AR (Repair Ship)	0	0	0	0	1	1
ARS (Salvage Ship)	0	0	0	0	1	1
AGOR (Oceanographic Ship)	3	1	2	2	1	9
Total	20	14	21	20	20	95
Conversions/SLEPs						
CV (Aircraft Carrier) SLEP	1	0	0	1	0	2
AO (Oiler) Conversion	1	0	0	0	0	1
MTS (Moored Training Ship)	1	0	1	0	0	2
Total	3	0	1	1	0	5

C. TACTICAL AIR FORCES

1. Introduction

a. Force Status and Rationale

Tactical air forces are a highly flexible and responsive element of our general purpose forces, supporting military operations on land, at sea, and in the air. The fighter and attack aircraft fielded since 1980 are more lethal and survivable than the systems they succeeded, and they are more capable under a broader range of operational conditions. Likewise, today's forces employ more sophisticated and effective weapons than were available in the inventory less than a decade ago. Moreover, our aircraft today are easier to support and are more fuel efficient than their predecessors, and most are capable of use in multiple roles. Chart III.C.1 portrays the changes in the force mix since 1982.

Impressive gains also have been made in the area of supporting systems. To combat the formidable Soviet air-to-air threat, we have upgraded our front-line fighters with better engines and avionics and now support them with the Airborne Warning and Control System (AWACS), other command and control platforms, and upgraded missiles. To enhance our ability to attack ground targets, we have fielded more capable missiles,

such as the Imaging Infrared (IIR) Maverick and High-Speed Antiradiation Missile (HARM). Numerous smart weapons capable of multiple kills are in development, as well as "brilliant weapons" that do their own targeting. Impressive complementary target acquisition systems are also being fielded. Together, these developments will improve significantly our already considerable tactical air capability.

As important as the capabilities of our new weapons systems is the fact that we are better prepared to use them in defense of our interests. Our squadrons are better trained than at any time since the Vietnam War. This is a direct result of the more reliable aircraft we now have in the inventory and the improvements we have made in mission training. A commitment to excellence also is evident in the training commands. The Navy will soon be fielding the new T-45 Goshawk training aircraft. Furthermore, the Air Force has taken the first step toward specialized undergraduate pilot training with the initiation of the Tanker Transport Training System (TTTS) program.

Despite these gains in readiness and capability, we are not resting on our past achievements. The Advanced Tactical Aircraft (ATA) and Advanced Tactical Fighter (ATF) are being developed to offset a numeri-

Tactical Air Force Structure

Chart III.C.1
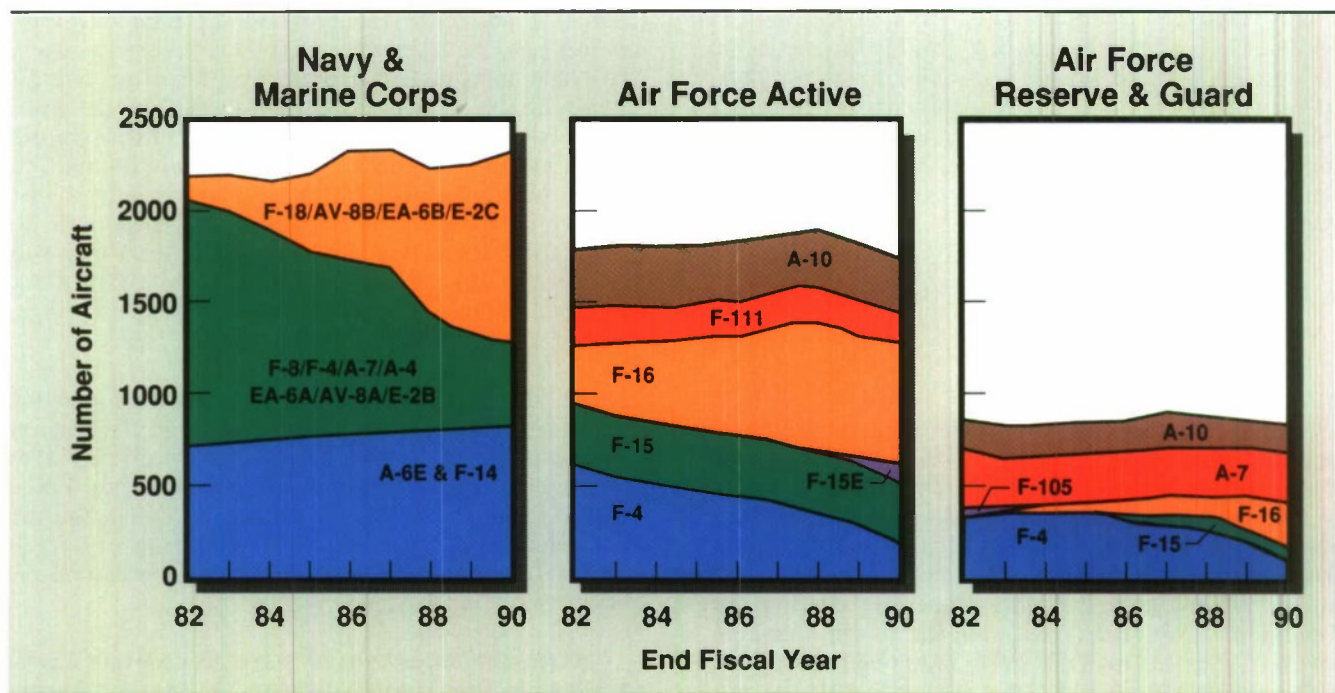
cally superior threat both in the air and on the ground. Likewise, we are looking at more capable alternatives to the shrinking A-10 force for the close air support role -- one of the Air Force's most important missions in support of Army ground forces.

b. Employment of Tactical Air Forces

U.S. air forces deployed around the world provide a highly credible and visible deterrent. Naval carrier deployments, coupled with Air Force and Marine participation in NATO and other Free World exercises, allow us to increase our readiness and gain valuable experience in working with allied forces. During the past year, our tactical air forces provided an important contribution to executing U.S. policy in the Persian Gulf. Navy aircraft conducted strikes against Iranian ships involved in hostile acts, and Air Force AWACS aircraft provided continuous surveillance and airborne early warning.

c. Goals for the Future

Despite the limitations imposed by a period of fiscal constraint, we have established force capability goals for the future. By the end of the century, we intend to have equipped our tactical air forces with considerable numbers of new-generation stealth aircraft -- the ATA and the ATF. These new aircraft will provide unprecedented increases in capability, allowing us to retire some older aircraft and thereby reduce the average age of the forces. Likewise, new weapons such as the Advanced Medium-Range Air-to-Air Missile (AMRAAM), currently entering production, and the Advanced Air-to-Air Missile (AAAM), in concept definition, will provide the lethal capability required to defeat increasingly sophisticated Soviet systems. These ambitious programs will require a consistent commitment through the 1990s to ensure our goals are realized.

2. Force Structure and Composition

a. Air Force

The Air Force currently has 37 tactical fighter wings (TFWs), based as shown in Chart III.C.2. By FY 1990, that number will decrease to 35. Within a fiscally constrained environment, we believe that a smaller, more robust, and fully trained force is preferable to a larger, less sustainable one. Although our long-term force structure goal is higher, increases beyond the 35-wing level will be deferred until the current planning cycle (FY 1990 through FY 1994) is complete and work has begun on the FY 1992-96 program. While the mix

of active and reserve forces will remain at the traditional level of about two-thirds active and one-third guard and reserve, some consideration may be given to a shift in the future.

The 401st Tactical Fighter Wing will be relocated from Spain to Italy, enabling us to retain the vitally important capability to defend NATO's southern flank. We have offset the reinstatement of the 401st TFW by reducing 72 primary authorized aircraft in CONUS units.

Our tactical fighter wings are currently composed of relatively new aircraft. As we await the introduction of our next-generation aircraft, the force's age will increase somewhat as a result of reduced procurement. Older F-111s, and perhaps other aircraft, will be modernized and retained beyond their originally projected retirement dates. In addition, tactical force procurement plans include improvements in night-attack capabilities, such as those provided by the Low-Altitude Navigation and Targeting Infrared System for Night (LANTIRN) scheduled for installation on F-15E and selected F-16 aircraft.

b. Navy and Marine Corps

The Navy has 15 air wings and the Marine Corps four, based ashore and afloat as shown in Chart III.C.3.

The Navy will maintain its current force of 13 active and two reserve air wings for the foreseeable future. This force level allows us adequate presence and training in peacetime and provides for immediate augmentation by both reserve wings during a contingency. The Navy continues to explore new mixes of aircraft that will enable its wings to exploit more fully the United States' advantages in air-to-air and air-to-ground combat capability. The USS Roosevelt will be the first carrier to deploy with the Navy's preferred aircraft mix, which consists of 20 F-14s, 20 A-6s, and 20 F/A-18s. By the end of FY 1996, three air wings will have converted to the Roosevelt wing mix. Our planning goal remains 14 active and two reserve air wings, seven of which would be of the Roosevelt type.

The Marine Corps maintains three active and one reserve aircraft wing. Each wing contains the tactical air assets required to support the Marine division it is aligned with as part of a Marine Expeditionary Force (MEF). These assets are an integral part of a Marine Air Ground Task Force, and are components of a force package designed to support theater commanders' requirements.

The basic composition of Navy and Marine Corps air wings is shown in Table III.C.1. In light of the

Locations of USAF Tactical Fighter Wings

Chart III.C.2

WA

MT

ND

MN

ME

VT

NY

NH

MA

RI

CT

NJ

DE

MD

DC

Hancock ANG

McGuire ANG

Andrews ANG

OR

ID

WS

MI

Selfridge ANG

Mountain Home AFB

WY

SD

Truax ANG

PA

CA

NV

UT

Hill AFB [a]

NE

IA

OH

Fort Wayne ANG

Rickenbacker ANG

Langley AFB

Des Moines ANG

CO

KS

MO

WV

Buckley ANG

Richards-Gebaur AFR

Grissom AFB

St Louis ANG

KY

NC

Seymour Johnson AFB

Nellis AFB [b]

AZ

NM

George AFB

OK

AR

TN

SC

Shaw AFB

Myrtle Beach AFB

Cannon AFB

TX

Carswell AFR

MS

AL

GA

Dobbins ANG

Holloman AFB

LA

Moody AFB

FL

England AFB

Eglin AFB

Homestead [a] AFB

AK

Eielson AFB

Elmendorf AFB

Pacific

Misawa AB

Osan AB

Kunsan AB

Kadena AB

Clark AB

Europe

RAF Lakenheath

RAF Bentwaters

RAF Upper Heyford

Bitburg AB

Hahn AB

Spangdahlem AB

Ramstein AB

Torrejon AB [c]

a Both Active and Reserve wings
b Wing to be deactivated
c Wing to move to Italy

capabilities of our projected new aircraft and possible upgrades to existing ones, we are taking yet another look at the composition of our Navy air wings. We expect the results of that investigation to be available in about two years.

Several new systems now in production or development will enhance our tactical air force capabilities. In FY 1988, we began procuring the F-14D, a significantly upgraded version of the combat-proven F-14A with new avionics and engines. Beginning in FY 1990, we will retrofit these upgrades into our existing F-14A fleet, thereby achieving a cost-effective alternative to

new procurement and expediting the introduction of new capabilities into the fleet. This effort will dovetail with ongoing Navy participation in the Air Force's ATF program. We expect a Navy variant of the ATF to provide a necessary and timely follow-on to the F-14D near the turn of the century. We plan to transform the ATF design into a naval fighter-interceptor aircraft that will provide a cost-effective counter to the evolving Soviet air threat of the next century.

In FY 1990, we will begin concept studies leading to development of an advanced tactical support system (ATS). The ATS is envisioned as providing follow-on

Disposition of Navy and Marine Corps Air Wings*

Chart III.C.3

Atlantic
Command

Japan

Pacific Command

LEGEND

| Navy Air Wing | Marine Aircraft Wing |
| Navy Reserve Air Wing | Marine Reserve Aircraft Wing |

*Chart reflects the non-deployed
locations of 13 active/2 reserve
Navy air wings and 3 active/
1 reserve Marine aircraft wings.
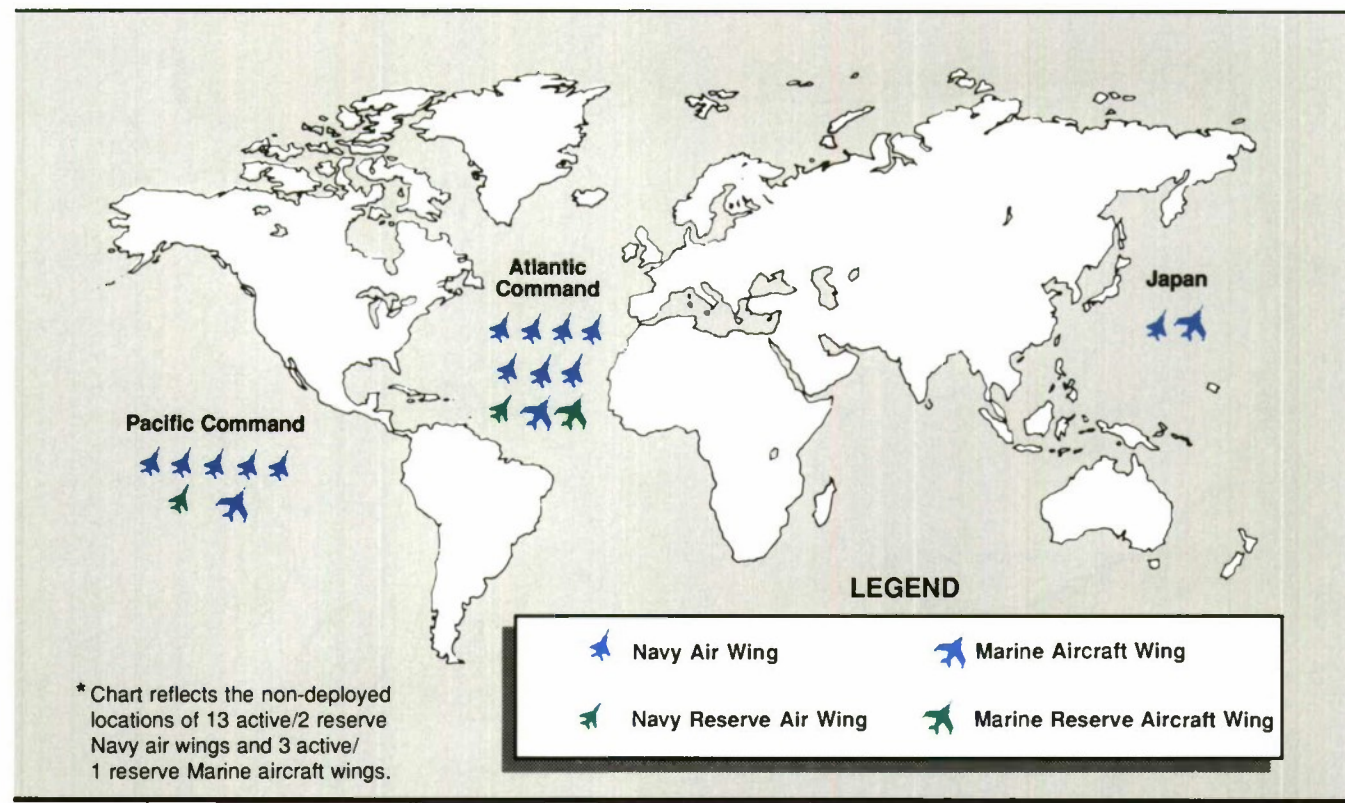
Typical Composition of Navy and Marine Corps Air Wings

Table III.C.1

	Navy		Marine Corps	
	Number of Aircraft			
Type of Aircraft	**Traditional Wing**	**"Roosevelt" Wing**	**Type of Aircraft**	**Number of Aircraft**
F-14	24	20	F/A-18	48
F/A-18(or A-7)	24	20	A-6	20
A-6	10	20	AV-8B	60
KA-6D	4	0	TA-4/OA-4	9
EA-6B	4	5	RF-4 or F/A-18	8
E-2C	4	5	EA-6B	6
S-3	10	10	KC-130	12
SH-3	6	6	CH-46	60
			CH-53	48
Total	**86**	**86**	AH-1	24
			UH-1	24
			OV-10	12
			Total	**331**

capabilities for several aircraft missions, including those now performed by the S-3B, EA-6B, EA-3B/ES-3, and E-2.

The ATA, now designated the A-12, will provide major increases in effectiveness and survivability over current systems. In order to produce a joint-service aircraft with significant savings to the taxpayer, the Air Force will be a major participant in the A-12 program.

As desirable as the A-12 is, its introduction will require an extended period of conversion and training. To maintain a deep-strike capability commensurate with the evolving threat, we are improving our existing A-6E force through modest avionics capability updates and wing replacements, as well as carefully managing our force assets.

3. Force Personnel and Training

a. Pilot Retention Problems

As outlined in Chapter II.C, the pilot retention problem remains grave. The Navy is currently more than 1,000 pilots short of its requirements. We are still seeking means to ameliorate the situation and are currently using bonus incentives to retain experienced pilots. The Marine Corps is facing a similar problem but of much lesser magnitude.

In the Air Force, pilot losses are being partially offset by decreases in requirements as we move from 37 to 35 wings, but shortages have increased in 1988 and are projected to exceed 2,400 by 1993. If the retention problem is not resolved soon, it will lead to shortages in tactical units and significant shortfalls in key supervisory and staff positions.

b. Aircrew Training

The combat readiness of our forces is directly related to the quality and intensity of training they receive. Training quality is a function of numerous factors: flying hours; training munitions expenditures; range, target, and airspace availability; threat simulation; and training facilities. The increasing capability of Soviet forces, along with the technological sophistication of our new systems, makes superior training an increasingly important advantage. Additionally, the pilot retention situation demands increased opportunities to provide seasoning to a younger, less experienced force.

We have made some gains in improving the quality of training by increasing its realism. More and better threat simulators and an increased number of instrumented ranges more than pay for themselves in the readiness gains our crews achieve. State-of-the-art facilities, such as the Tactical Aircrew Training System (TACTS)/Air Combat Maneuvering Instrumented (ACMI) ranges, provide pilots an opportunity to analyze their tactics and critique their performance in real time with the aid of computerized displays.

Added realism through training in the way we expect to fight is a goal of our exercises. There are numerous examples of this approach, including the joint-service Red Flag exercises conducted at Nellis AFB, Nevada, and the Cope Thunder series in the Philippines. In addition, the Services each sponsor numerous exercises individually and conduct special tactics and training development programs for their forces. Aircrew participation in such exercises peaked in 1987 at double the rate of 1980. We feel such training is important and have funded it accordingly.

Navy tactical air training, in particular, is sensitive to annual operating tempos. Deployments such as those in the Persian Gulf last year, and long at-sea periods in the Indian Ocean, consume a large portion of the flying-hour budget. While such operations provide training and improve readiness for carrier operations, they are not very useful for maintaining proficiency in all combat skills. Additionally, contingencies such as the Persian Gulf operation disrupt training programs. Meeting the needs of deployed aircrews while not shortchanging shore-based aircrew training programs remains a major concern.

4. FY 1990-94 Programs

a. Program Goals

The FY 1990-94 program reflects our continued determination to maintain a qualitatively superior force that can deter or defeat an improving Soviet threat. Our plan is to:

- Maintain the readiness and sustainability of our forces through improved training, larger stocks of spare parts, and more lethal munitions;

- Modernize the active and reserve forces with more capable aircraft, using competitive procurement and other measures to hold down costs;

- Identify beneficial competitive strategies and emerging technologies to augment our surveillance, target-acquisition, and weapons capabilities; and

- Make progress toward our force structure goals.

b. Readiness and Sustainability

The past eight years have seen substantial gains in readiness and sustainability. Although pilot retention is a concern, we have been able to keep operational units at full strength. The decreased experience level of our aircrews requires a commitment to quality training, and in this regard we have made great strides. Average annual flight time remains adequate, and we have improved both the availability and quality of training.

Budget reductions, however, threaten some of this progress. We have had to curtail our efforts to redress the significant shortfall in war reserve materiel, which is critical for extended conflict. Spares, in particular, have been hard hit. For example, the Air Force was unable to fund War Reserve Spare Kits (WRSK)/Base-Level Self-Sufficiency Spares (BLSS) in FY 1988-89.

c. Force Modernization

(1) Air Force Programs

The Air Force's FY 1990-94 programs are dedicated to maintaining the qualitative superiority of our tactical air forces. We will continue to modernize, replacing older aircraft, such as F-4s, with modern F-15Es and F-16s and developing the ATF and ATA to help ensure tactical air superiority in all mission areas. Our frontline aircraft are being upgraded with more advanced systems, such as the Airborne Self-Protection Jammer (ASPJ) on the F-16 and LANTIRN on the F-15E and F-16, to keep pace with the threat. Additionally, we are procuring new engines with improved reliability and maintainability as well as increased power. We are also looking at replacement options for our A-10 close air support aircraft. The following program summaries provide more details on these activities.

F-16: F-16 procurement will be reduced to 150 aircraft per year in FY 1990-94 due to fiscal constraints. In FY 1991, full-scale development (FSD) will begin on an F-16 derivative with sufficient air superiority improvements to complement the ATF by the mid-1990s. It also will provide an attractive option for allied countries who must modernize their tactical air forces. The early engineering activity needed to support an FSD program began in FY 1989, in conjunction with the F-16 consortium countries. New wing and engine options that increase performance will be considered before we make a final decision on the aircraft's design.

F-15: Continued upgrades of the F-15 -- our current front-line air-superiority fighter -- will ensure that it remains capable against the threat throughout the 1990s. Improvements include upgrades to the aircraft's radar, electronic counter-countermeasures (ECCM),

self-protection, and missile systems. Integration of the AMRAAM into the aircraft in future years will enable it to engage multiple targets, further enhancing its combat performance.

F-15E: In FY 1989, we began deploying the F-15E to complement our F-111 interdiction force. This advanced all-weather fighter has proven capabilities for long-range air-to-surface attacks employing the gamut of munitions, while remaining fully capable for beyond-visual-range air-to-air employment. The F-15E's ability to attack targets deep in enemy territory around-the-clock or swing to the air-to-air role increases our capability to meet worldwide contingencies and execute war plans. F-15E procurement will continue through FY 1994.

Advanced Tactical Fighter (ATF): To preserve our air superiority capability, we plan to procure the ATF beginning in FY 1993. The ATF is designed to penetrate enemy airspace and dominate the enemy air threat by achieving a "first look/first kill" capability against multiple targets. This will enhance the ability of new and existing fighters to conduct combat operations around-the-clock. The ATF offers a balanced combination of reduced observability, sustained supersonic performance, highly integrated avionics, and superior maneuverability. It will carry a lethal mix of both beyond-visual-range and short-range weapons.

Close Air Support: A-10s will be phased out of the force beginning in FY 1992. In evaluating possible follow-on systems, we are considering both modified versions of existing aircraft and entirely new designs. The most promising candidates will compete in a fly-off in the early 1990s. We have included funds in the five-year program to support whatever decision emerges at that time.

A-7D Modification: We had originally planned to begin retiring A-7s in the early 1990s. Analyses have shown, however, that with modifications to their airframes and avionics, these aircraft could provide additional years of service. Funds have been set aside in the budget to produce two prototype aircraft to determine the feasibility of this approach, and these prototypes will compete in the close air support fly-off.

A-12 Advanced Tactical Aircraft (ATA): A variant of the Navy's ATA, the A-12, is being procured by the Air Force to enhance the long-range air-to-surface attack capability of its forces.

Low-Altitude Navigation and Targeting Infrared System for Night (LANTIRN): This twin-pod system will help F-15Es and F-16C/Ds navigate and locate targets at night and under the weather, thus denying the enemy the sanctuary of darkness. After completing a

successful test program, the navigation pod is now in production. The targeting pod has undergone initial operational testing and is in limited production.

Along with acquiring more capable aircraft, improving the weaponry carried by our fighter force has been a top priority of our modernization programs. This includes buying combat-proven air-to-air missiles, such as the AIM-7M Sparrow and AIM-9M Sidewinder, as well as developing new ones like the AIM-120 AMRAAM. We also are producing advanced versions of existing systems -- the IIR Maverick air-to-ground missile is a prime example -- and will move from development to production on more effective air-to-ground munitions for the future. These munitions include the Sensor Fuzed Weapon (SFW) and Direct Airfield Attack Combined Munition (DAACM). The following program descriptions summarize our activities in this area.

AGM-65D/G/F Imaging Infrared (IIR) Maverick: This version of the versatile Maverick missile is being procured by the Air Force to support Army ground forces. Unlike the earlier version, which used an on-board television camera for guidance, the D model has an infrared seeker, enabling it to operate equally well in day or night and in all but the most adverse weather conditions. The G version is quite similar in design, but has a larger warhead for use against hardened targets. The Navy is procuring an F variant, a G model modified with Navy-unique fuzing and safe-and-arm devices.

AIM-7M (Sparrow): Used by the Navy, Air Force, and Marine Corps, the Sparrow is the mainstay of our radar missile inventory and will remain so until AMRAAM can be produced in quantity. The Sparrow features semiactive radar guidance and can operate in all types of weather against a wide variety of electronic countermeasures. FY 1989 is the last year of Sparrow procurement.

AIM-9 (Sidewinder): The Sidewinder is our close-in "dogfight" missile, used by Navy, Air Force, and Marine Corps. The FY 1989 budget completes procurement of the "M" version of the missile, which is infrared-guided and can acquire and track targets in a high-infrared-clutter environment. The Navy will continue work on the next Sidewinder improvement (AIM-9R) in FY 1990. It features an improved capability in clutter and a significant counter-countermeasure capability. The AIM-9R will provide an interim capability until the ASRAAM is available.

Advanced Short-Range Air-to-Air Missile (AS-RAAM): Our next-generation short-range missile, the ASRAAM is the planned replacement for the AIM-9. In a memorandum of understanding signed with Germany, Norway, and Great Britain, we agreed to develop AMRAAM while the Europeans develop ASRAAM. The agreement's intent is to avoid costly duplication of effort and increase NATO standardization and interoperability.

AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM): Our newest air-to-air missile, the AMRAAM features an active radar seeker that gives it a "launch-and-leave" capability. Its sophisticated electronics will ensure that the missile remains effective against the electronic countermeasures threat through the 1990s. The system was approved for initial production in FY 1987 and has been procured in limited quantities since then. Reflecting the planned completion of full-scale development in FY 1989, we have included funds in the budget to increase production to more efficient levels beginning in FY 1990. The missile will be used by the Navy, Air Force, and Marine Corps, as well as by our European allies.

Sensor Fuzed Weapon (SFW): The SFW is a smart cluster weapon that uses an infrared sensor to home in on its target. With its multiple-kills-per-pass capability, we consider this antiarmor weapon to be a top modernization priority. Problems encountered during the system's development have slowed its transition from testing to production, but we expect it to be ready for low-rate production in FY 1991.

Direct Airfield Attack Combined Munition (DAACM): The DAACM is a cluster weapon designed to break up runways and delay repairs by simultaneously dispensing area denial mines. The system is now in development and testing, and we plan to begin producing it in FY 1992.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
F-16				
Development:				
$ Millions	25.1	26.2	33.5	177.0
Procurement:				
Quantity	180	180	150	150
$ Millions	2,740.0	3,245.0	3,262.7	3,035.5
F-15				
Development:				
$ Millions	99.2	87.6	124.6	101.8
Procurement:				
Quantity	42	36	36	36
$ Millions	1,510.7	1,479.7	1,571.5	1,530.4
LANTIRN				
Development:				
$ Millions	19.3	4.7	3.5	-
Procurement:				
$ Millions	820.0	727.3	358.3	277.9
CAS/A-C				
Development:				
$ Millions	-	-	66.0	55.0
A-7D/Mod				
Development:				
$ Millions	48.6	73.0	24.2	4.9
IIR Maverick				
Procurement:				
Quantity	3,300	3,551	2,830	4,155
$ Millions	358.3	350.0	260.2	372.0
ASRAAM				
Development:				
$ Millions	1.0	1.0	5.0	6.5
AMRAAM				
Procurement:				
Quantity	400	900	1,600	3,000
$ Millions	673.1	835.9	1,048.6	1,305.8
SFW				
Development:				
$ Millions	22.0	26.8	27.7	-
Procurement:				
Quantity	-	-	-	65
$ Millions	-	-	-	118.7
DAACM				
Development:				
$ Millions	8.1	13.5	17.0	19.1

(2) Navy and Marine Corps Programs

As part of the modernization of our naval and Marine tactical air forces, we plan to equip active squadrons with new F/A-18s, AV-8Bs, and F-14Ds, and reserve squadrons with A-6s, F-14s, and F/A-18s. Additionally, we will complete development and commence procurement of the A-12 as a replacement for the A-6. The following section provides more details on these programs.

F-14: The F-14 is our all-weather air-superiority fighter. Armed with long-range Phoenix missiles, it constitutes the outer ring of our carrier defenses. To ensure its effectiveness through the 1990s, we are upgrading the aircraft's radar, avionics, fire control systems, and engines. An F-14A model with the F110 advanced-performance engine is now entering service, and a new F-14D model began production in FY 1988. The F-14D incorporates a new digital avionics suite, the ASPJ electronic countermeasures system, an advanced air-to-air radar, infrared search and track, and more reliable, high-performance engines. It will be capable of engaging multiple targets with the new AMRAAM. These capabilities will be incorporated into earlier-model F-14s in a remanufacturing program scheduled to begin in FY 1990. The last two Naval Reserve F-4 squadrons completed their transition to F-14s during FY 1988.

A-6: The A-6 is our only true all-weather carrier-capable strike aircraft. Its primary mission is deep interdiction of both sea and land targets. Repeated upgrades have kept the A-6 one of our most reliable and versatile attack aircraft. To maintain its effectiveness in the future, we are making modest upgrades to some E models. This program, known as (A-6) SWIP, will improve the aircraft's standoff attack capability and extend its service life, allowing it to remain the mainstay of the all-weather medium-attack force until the ATA is fielded in the late 1990s. The Naval Reserve began its transition to the A-6E and KA-6D in FY 1988, and will receive the EA-6B in FY 1989. These additions will complete the reserve modernization program by FY 1991.

AV-8B: This second-generation vertical/short takeoff and landing (V/STOL) aircraft is replacing the AV-8A/C and the A-4M in Marine Corps air wings. Designed for operations from austere sites or amphibious ships, the AV-8B combines basing flexibility with range and payload comparable to modern aircraft. Its primary mission is to provide close air support to front-line commanders while operating from unprepared airfields near the battle area. Compared with earlier V/STOL models, the AV-8B has significantly greater range, payload, and operational versatility. It is ranked among the best combat aircraft in the world in weapons delivery accuracy. Like the F-14D, the AV-8B will be equipped with the new ASPJ, greatly enhancing its survivability in high-threat environments. Beginning in 1989, the AV-8B will be equipped with a night-attack capability. Procurement of the AV-8B is scheduled to end in FY 1991 -- short of the original program -- with eight AV-8B squadrons of 20 aircraft each.

F/A-18: The F/A-18 is the backbone of our modernization effort. It is replacing the F-4, RF-4, A-7, and A-4M in both the Marine Corps and the Navy. The aircraft's reliability and maintainability have surpassed initial expectations, yielding increases in sortie rates and mission-capable status, while reducing maintenance man-hours. As a result, the F/A-18 has maintained a safety record unmatched by any previous new tactical aircraft. This improvement over expected peacetime attrition levels has partly compensated for a reduction in F/A-18 procurement. In FY 1986, a new C model featuring upgraded electronic countermeasures equipment, expanded air-to-air capability, and upgraded avionics entered production. In FY 1988, we began procuring the F/A-18D, a two-seat all-weather version designed to meet Marine night attack and reconnaissance requirements. Beginning in FY 1990, we will procure 72 F/A-18s per year under a multiyear contract. Additionally, we are undertaking a major radar upgrade program commencing in FY 1990 that will significantly enhance F/A-18 air-to-air capability. For the longer term, we continue to investigate enhancements that would improve the F/A-18's performance in support of the new ATA and ATF forces. These include engine, structural, and avionics upgrades and would involve a derivative aircraft. The radar upgrade program is part of that effort. We remain open to potential allied codevelopment opportunities involving F/A-18 upgrades and future derivatives. This effort, commonly referred to as "Hornet 2000," offers a means of enhancing our overall tactical air capabilities while minimizing acquisition costs for ourselves and our allies. Allied support is an important determinant of the program, but it is not the only one. If we decide to pursue development of the Hornet 2000, it will be funded out of the existing F/A-18 program.

A-12 Advanced Tactical Aircraft (ATA): The ATA is the planned replacement for the A-6. It incorporates advanced low-observable (stealth) technologies, and will enhance significantly the Navy's power-projection capabilities. It is being developed jointly by the Navy and the Air Force.

T-45: A derivative of the British Hawk, the T-45 will replace both the T-2 and TA-4 as the Navy's training aircraft and is being considered by the Air Force for its future training needs as well. The T-45 package employs a "total training system" approach that in-

cludes aircraft contractor maintenance, simulators, and a training integration system. We have made structural modifications in the aircraft so that it can be used for carrier operations and are considering further up-grades, such as adding a digital cockpit, to make it more compatible with our newer fighters. The first squadron of T-45s will become operational in FY 1990.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
F-14				
Development:				
$ Millions	168.0	152.9	169.9	119.7
Procurement:				
Quantity	12	12	18	24
$ Millions	818.8	951.5	1,227.9	1,347.6
A-6E				
Development:				
$ Millions	3.3	1.4	23.2	21.1
Procurement:				
$ Millions	219.5	121.6	63.4	66.3
AV-8B				
Development:				
$ Millions	36.5	38.8	29.5	30.3
Procurement:				
Quantity	24	24	24	24
$ Millions	584.8	577.0	562.7	520.4
F/A-18				
Development:				
$ Millions	11.8	13.0	50.6	77.9
Procurement:				
Quantity	84	84	72	72
$ Millions	2,436.8	2,498.8	2,683.4	2,183.2
T-45				
Development:				
$ Millions	94.6	88.8	26.5	14.6
Procurement:				
Quantity	12	24	24	48
$ Millions	392.2	428.7	446.3	643.7
AIM-54A/C				
Procurement:				
Quantity	360	450	420	420
$ Millions	341.6	395.2	378.9	327.6
AAAM				
Development:				
$ Millions	16.1	30.0	74.7	84.9
SLAM				
Development:				
$ Millions	31.5	22.3	-	-
AIWS				
Development:				
$ Millions	11.7	14.3	25.2	61.0

Navy Advanced Tactical Fighter (NATF): The Navy plans to produce a variant of the Air Force's Advanced Tactical Fighter as the follow-on to the F-14D. The Navy aircraft could be available within three to four years of the ATF's initial deployment date.

Complementing these aircraft modernization programs is a range of initiatives to improve our inventories of aircraft munitions. The following program descriptions provide a summary of these efforts.

AIM-54C (Phoenix): This long-range air-to-air missile is designed to protect the fleet from bombers armed with antiship missiles. Up to six Phoenix missiles can be carried on each F-14. Procurement of the C model will continue through FY 1992.

Advanced Air-to-Air Missile (AAAM): The AAAM, the successor to the Phoenix, has entered the demonstration/validation phase of its development program. The AAAM will be much lighter than the Phoenix, allowing it greater range and speed. Moreover, it will be compatible with many front-line fighters, including the ATF and ATA, overcoming one of the major drawbacks of the Phoenix. The AAAM also will have an improved ECCM capability and will be effective against stealth targets.

Standoff Land-Attack Missile (SLAM): The SLAM provides a long-range capability against high-value targets. Limited production of the system has been approved, and the first operational tests will be conducted this year. The Navy began procuring the missile in FY 1988, and the Air Force will test it during FY 1990.

Advanced Interdiction Weapon System (AIWS): The AIWS missile will provide a launch-and-leave capability against surface targets such as air defense sites, armor, and small ships. Proposals from industry were received during late FY 1988, and a contract for the system's development will be awarded to two or more firms in FY 1989.

(3) Electronic Warfare

Improving the electronic combat capabilities of our forces has been one of the major goals of our modernization program. It also has been an area in which we have faced some of our greatest technical challenges. Traditional approaches based on radar warning systems, active jamming, and suppression weapons will be complemented in the future by the introduction of the low-observable (LO) technologies featured in our next-generation aircraft. The following program descriptions summarize our efforts in this area.

(a) Air Force Electronic Warfare Programs

F-4G (Wild Weasel): The G version of the F-4 Phantom has been refitted with specialized electronic warfare equipment and armed with antiradiation missiles, including the HARM. The aircraft is designed to locate and suppress or destroy enemy radar and surface-to-air missile sites autonomously, so as to provide protection for our strike and reconnaissance forces. The fleet is being upgraded to cope with the electronic threat projected for the 1990s.

EF-111A: The 42 aircraft in the EF-111A fleet are designed to jam enemy early warning, acquisition, and ground control radars. The planes can operate from standoff ranges or be employed in close proximity to other tactical aircraft. We are working on improvements in the aircraft's tactical support jamming gear to increase reliability and maintainability and provide some added capability. With these modifications, the aircraft will be able to remain in service into the next century.

Tacit Rainbow: Tacit Rainbow is a lethal antiradiation cruise missile being developed jointly by the Army, Navy, and Air Force. A "smart" weapon, it is designed to loiter outside the target area after being fired, until an enemy radar emits a signal that it then rides to the ground. An air-launched version of the weapon is currently undergoing testing, and a ground-launched variant, for use by the Army and potentially other Services, will enter development in FY 1990. As a result of recent developmental difficulties, low rate initial production plans for the air-launched version have been delayed until fourth quarter of FY 1990.

Airborne Self-Protection Jammer (ASPJ): This internally mounted system is designed to detect and analyze enemy radar signals and select the correct electronic countermeasure to jam them. It is being developed jointly by the Air Force and the Navy for installation on F-16Cs, F/A-18s, F-14Ds, and AV-8Bs. Flight tests of the system began in FY 1988, and it will be deployed beginning in the early 1990s on both new and existing aircraft.

Integrated Avionics (INEWS/ICNIA): INEWS/ICNIA technologies, under development by the Air Force and the Navy, will make major changes in the way we add new capabilities to our avionics systems. INEWS/ICNIA systems will employ common electronic-combat communications, navigation, and identification hardware and software modules in various combinations tailored to the mission requirements of particular aircraft types. This will reduce the costs of developing and integrating these increasingly sophisticated and complex systems into our aircraft. The

equipment is slated to be installed on Air Force ATFs, Navy ATAs, and possibly Army LHX helicopters.

(b) Navy Electronic Warfare Programs

AGM-88 High-Speed Antiradiation Missile (HARM): This air-to-surface missile, deployed with Navy and Air Force aircraft, guides itself to its target by homing in on radar beams. The system will be procured through FY 1994. The HARM has already been integrated with the avionics of the F-4G, A-7E, F/A-18, A-6E, F-16, and EA-6B. We are working to improve the missile's coverage, effectiveness, and versatility through the HARM Block IV upgrade and Low Cost Seeker (LCS) programs.

EA-6B: This tactical support aircraft is used to suppress enemy early warning and acquisition radars. The system's performance is currently being enhanced through Advanced Capability (ADVCAP) upgrades. ADVCAP will increase significantly the EA-6B's effectiveness and frequency coverage, as well as achieve a quantum increase in system reliability and maintainability. Together with the integration of the HARM system, these upgrades will substantially improve weapon system effectiveness. We have decided to terminate

future EA-6B procurement and manage existing assets to meet our requirements while we remanufacture existing aircraft, beginning in FY 1991. The remanufacture program will incorporate ADVCAP capabilities and associated airframe improvements into existing EA-6B assets.

Advanced Tactical Support (ATS) System: This new system is intended to perform surveillance and electronic warfare support missions that require range and airborne loiter capability. The funds requested for FY 1990 will be used to evaluate land-based, carrier-based, and off-board candidates for the ATS mission.

(4) Target Acquisition, Surveillance, and Reconnaissance

Airborne Warning and Control System (AWACS): AWACS aircraft are routinely deployed overseas in both training exercises and peacetime surveillance missions. A number of AWACS planes are stationed in Okinawa, Iceland, and Alaska, and four have been operating in Saudi Arabia at that government's request, monitoring activities in the Persian Gulf. The United States also participates in the operation of 18 additional E-3s in Europe that are part of a joint NATO fleet.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
Tacit Rainbow				
Development:				
$ Millions	88.6	44.7	82.6	82.5
Procurement:				
$ Millions	55.1	159.9	-	192.2
ASPJ				
Development:				
$ Millions	33.2	18.3	15.9	18.8
INEWS/ICNIA				
Development:				
$ Millions	43.8	74.2	81.5	3.5
HARM/LCS				
Development:				
$ Millions	31.5	24.9	27.4	10.7
Procurement:				
Quantity	2,297	2,200	1,488	1,600
$ Millions	555.4	520.3	376.9	401.1
ATS				
Development:				
$ Millions	-	-	1.0	1.5

We are working on a number of upgrades for the AWACS. Operator consoles for additional crew members are now being installed, and testing will take place beginning in FY 1990 on an improved Joint Tactical Information Distribution System (JTIDS), Global Positioning System (GPS) navigation capability, and an Electronic Support Measures (ESM) system.

The Radar System Improvement Program (RSIP) will incorporate a new radar signal processor to increase detection performance and improve reliability and maintainability. This will enable the aircraft to pick up the radar signatures of hostile targets employing advanced technologies to reduce detection.

Joint Surveillance Target Attack Radar System (JSTARS): The JSTARS can improve our knowledge of enemy ground force movements occurring far behind the front line. Side-looking radars will help Army and Air Force units locate, identify, and attack these "deep" targets well before they reach the main battlefield. If these efforts succeed, JSTARS will add a unique surveillance and attack capability in the 1990s. The system currently is in full-scale development, and the first fully equipped test aircraft will commence flight testing this year.

Advanced Tactical Air Reconnaissance System (ATARS): The ATARS is an umbrella concept for a series of upgrades in joint tactical reconnaissance capabilities. The Air Force is the lead service for ATARS sensor acquisition. Major elements of the program include: the Tactical Air Reconnaissance System (TARS); the Unmanned Air Reconnaissance Vehicle (UARV); and the Joint Services Imagery Processing System (JSIPS), a ground equipment package.

The TARS, now in full-scale development, consists of electro-optical sensor suites (sensors, recorders, a video management system, and data-link sets) that can be installed in manned or unmanned vehicles. The sensors will be tested on modified RF-4C aircraft. We are considering several aircraft for the manned mission, including a modified F-16 and the F/A-18D. A final decision is expected in FY 1990 or FY 1991.

Full-scale development of the mid-range UARV began in FY 1989. The UARV will carry the ATARS sensors, fly at subsonic speed, and incorporate signature-reduction features to enhance survivability. Both the Air Force and Navy plan to procure this system. The Air Force will deploy UARV units in existing RF-4C squadrons, recovering the vehicles after each flight. The Navy will put air-launched and expendable UARVs aboard aircraft carriers and also plans to procure target drone versions. The Marine Corps will air-launch the mid-range UARV from the F/A-18D aircraft.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
E-3A Modification				
Development:				
$ Millions	96.5	116.1	139.6	126.2
Procurement:				
$ Millions	21.8	16.4	36.5	104.2
JSTARS				
Development:				
$ Millions	355.3	258.8	193.1	109.9
ATARS				
Development:				
$ Millions	138.4	143.8	290.9	265.1
E-2C Modification				
Development:				
$ Millions	21.7	22.8	38.9	36.9
Procurement:				
$ Millions	40.8	40.5	71.7	57.4

E-2C (Hawkeye): This carrier-based airborne surveillance aircraft proved its worth last year during the operations in the Persian Gulf. In addition to being deployed with U.S. naval forces, the E-2C has been sold to Japan, Israel, Singapore, and Egypt, and additional foreign military sales are possible. As the E-2C has evolved in capability, there has been a significant growth in the weight of its avionics systems. We are currently undertaking structural assessments to ensure that the existing aircraft inventory will be able to achieve its projected service life. In FY 1988, we installed more powerful engines in the aircraft, and in FY 1991 an enhanced radar (the APS-145) will be fielded. This upgrade will improve performance significantly in the overland/surface surveillance modes, extend the aircraft's maximum detection range, and incorporate improved IFF (identification friend-or-foe) capabilities. Commencing in FY 1991, we will procure nine aircraft per year under a multiyear contract.

5. Conclusion

Our tactical air forces are designed to meet and defeat the threat -- both now and in the foreseeable future. We have made significant progress over the past eight years in improving the readiness, sustainability, and combat capability of the forces. Maintaining the momentum of these efforts will require a sustained commitment in future budgets. The fielding in adequate numbers of critical systems currently in the research and development phase will ensure that the forces retain the capability to execute their wartime missions and, thereby, preserve the nation's security.

D. FORCE PROJECTION

1. Introduction

Our strategy of deterrence and forward defense with a minimum of active-duty forces in peacetime, particularly forces stationed abroad, requires an ability to mobilize and deploy forces rapidly in the event of a crisis or conflict. The essential elements of this strategy -- active forces serving as the vanguard of our response to aggression, reserve forces capable of mobilizing quickly, and projection forces capable of rapidly transporting combat forces and their support to the scene of a crisis -- maximize our conventional deterrent capability at the lowest cost. Since this administration took office, we have worked aggressively to improve our capabilities to mobilize and deploy forces in support of this strategy.

Many of the programs that were begun in the early 1980s have come to fruition, while others are well under way. These programs continue to enjoy high priority. Despite the fiscal retrenchment we have now undertaken, major programs for mobilization and deployment have not been slowed or cancelled but remain on schedule. In a few cases, we have begun new programs in recent years, although they are modest in scope and aimed primarily at maximizing the value of the major investments of the past.

2. The Mobilization Process

In deterrence and defense equations, our ability to mobilize rapidly and efficiently to reinforce fighting elements in the conflict area is as important as the capability of the active forces to engage the enemy. This complex mobilization process requires extensive planning and preparations in peacetime if our forces are to be prepared for rapid mobilization in wartime.

a. Mobilization Manpower Planning

The Wartime Manpower Planning System (WAR-MAPS) is a data base of Service information on our time-phased wartime military and civilian manpower requirements and estimated supply. These data provide the basis for identifying shortfalls and developing alternatives to deal with these shortfalls.

Charts III.D.1 and III.D.2 display current WAR-MAPS demand and supply data for the military and civilian manpower needed to engage in a worldwide conflict.

Wartime Military Manpower Requirements

Chart III.D.1
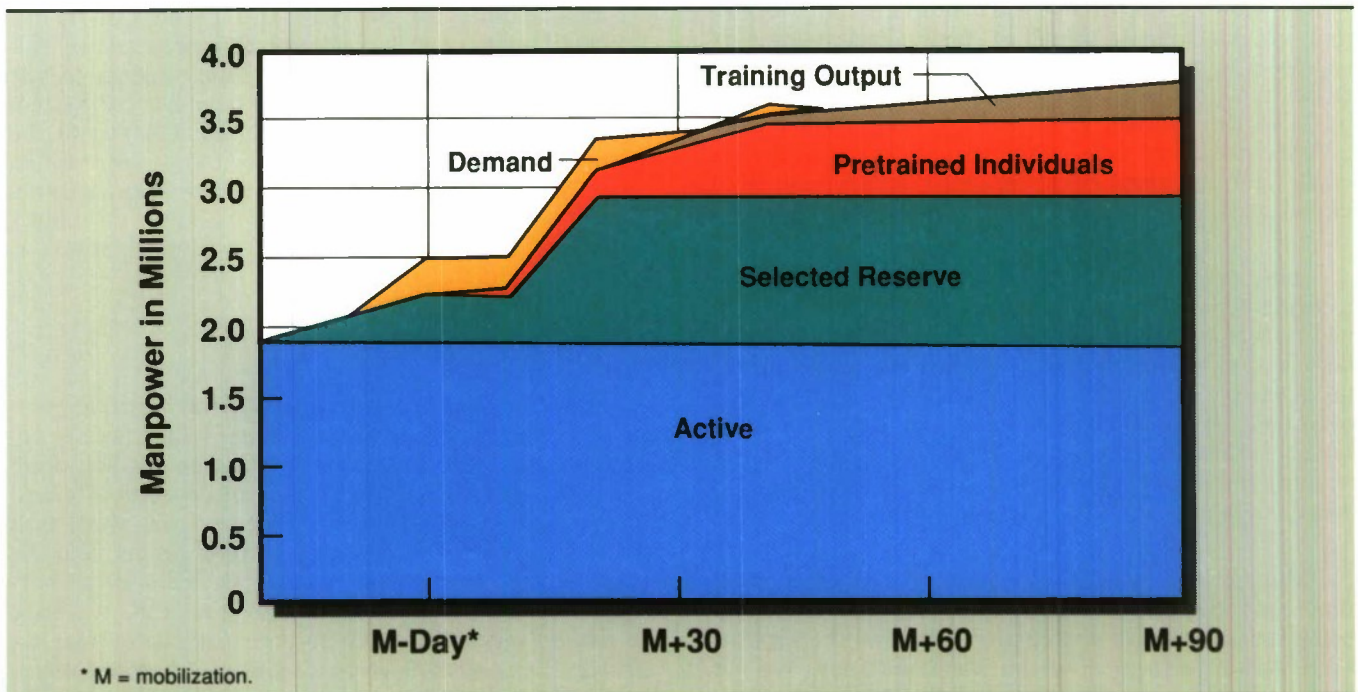
* M = mobilization.

Wartime Civilian Manpower Requirements

Chart III.D.2

*30 days after mobilization
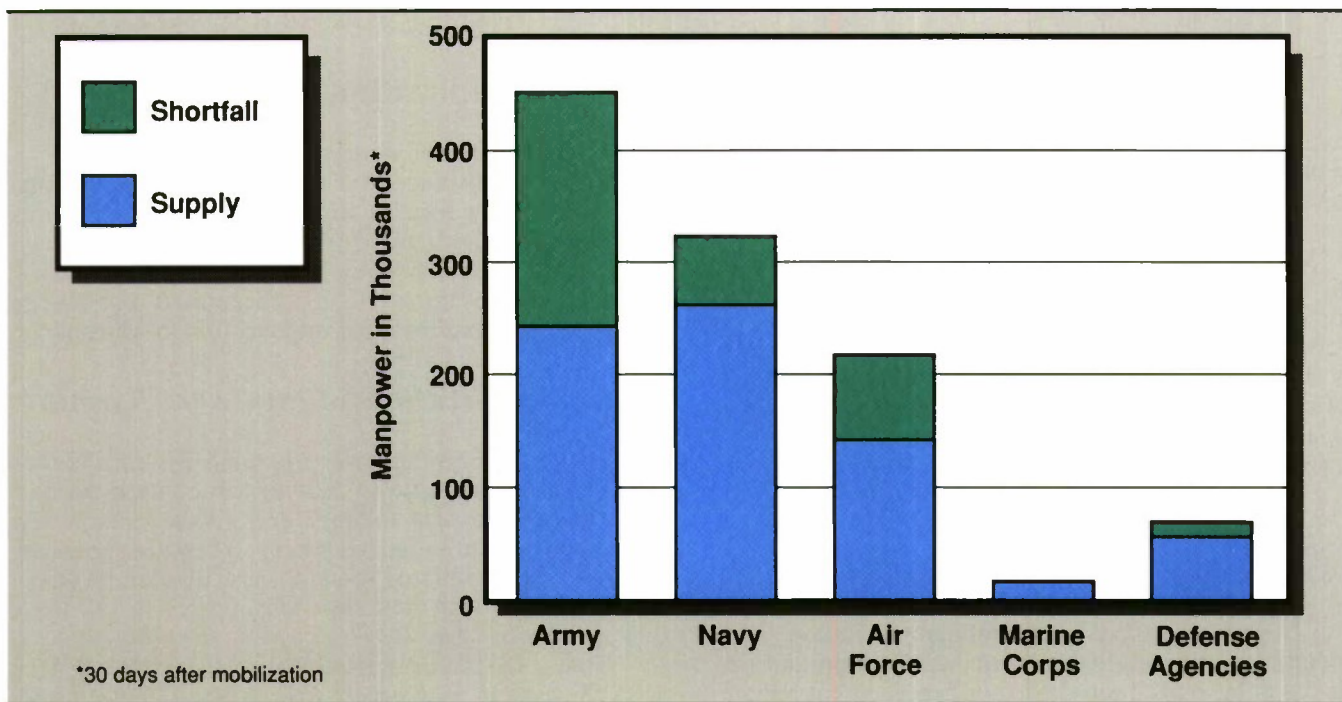
b. Military Manpower for Mobilization

We continue to identify and develop human resource alternatives to our current manning structure that will enable us to use all of our military manpower resources in wartime. This analysis of our supply includes not only the active and selected reserves forces, but also the Individual Ready Reserve (IRR), retired military personnel who could be recalled to duty in a crisis, and untrained personnel who would be drafted and trained.

Individuals from the Ready Reserve would be used to bring active and reserve units to authorized strength and to replace untrained or partially trained unit members as well as initial casualty losses. We are establishing a variety of policies to ensure the early availability of skilled IRR members to meet our wartime requirements: annual mandatory screenings, skill proficiency testing, refresher training, mobilization readiness exercises, and personal status updates.

Military retirees are an important source of wartime manpower. These individuals can be recalled to bring units to wartime strength, to expand the support base, or to perform other military functions. We are looking into a wide variety of possible assignments for military retirees other than the traditional training and administrative roles.

In wartime, the Services also require many individuals without prior military experience who, following training, are needed as replacements in the force. When we mobilize, the Selective Service System can deliver hundreds of thousands of inductees to the Armed Forces. We are currently reviewing our training base capacity to absorb them. We are also working with the Selective Service to develop a system to induct critical skills, in particular medical personnel, should it be necessary in wartime.

We are assessing the accuracy of our wartime manpower requirements estimates. In particular, we are focusing on the Services' casualty estimates which drive wartime demand. We have begun a long-term effort to analyze our casualty estimates by comparing them with historical experience, our field exercise results, and the estimates of our allies. The analysis includes a thorough review of current methodology as well. We hope to not only determine the accuracy of our current estimates, but also to develop alternative improved methodologies and casualty rates.

c. "First to Fight, First to Equip"

Under the "first to fight, first to equip" policy initiated in 1982, early deploying units, regardless of component, receive priority in equipment distribution and modernization. As a result, certain Reserve Component units are receiving large quantities of new or redistributed major equipment items such as tanks, helicopters, fighter and transport aircraft, wheeled vehicles, and hospital sets, according to the order they deploy. This has improved on-hand equipment readiness, but critical shortages of required equipment continue to exist.

d. Civilian Manpower for Mobilization

Without our DoD civilian work force, our military forces cannot mobilize, deploy, and be sustained. We are focusing on improving mobilization planning and preparedness for the more than 300,000 members of the civilian work force who will be required almost immediately upon mobilization to meet expanded wartime support requirements and to replace employees who have a military obligation. In addition, large numbers of civilian employees now in peacetime positions overseas would be essential to the support of wartime operations. We have modified DoD directives to help ensure these essential people would continue to work in an emergency.

Within the last two years we have also revised additional directives to resolve problems such as competition between the Services for workers with critical skills, peacetime impediments to wartime recruitment, retention of the peacetime work force during mobilization, and screening of the work force for potential losses to military service. We are working with the Services to see that new management policies are implemented and that procedures are developed to carry out these policies in wartime.

We also need to ensure the continued availability of our foreign national work force. This force constitutes fully ten percent of our peacetime civilian work force and is a critical factor in the early phases of mobilization. As part of our review of the composition of the foreign national work force we have just begun to look at our wartime needs for foreign national civilians, and the data are not complete.

e. Exercises

Exercises are our primary means for evaluating mobilization plans, policies, and procedures. They are useful in identifying problems, developing solutions, and in retesting the system to check our progress.

Just a little over a year ago, the Office of the Secretary of Defense and the Joint Chiefs of Staff sponsored a very successful executive decision-making exercise in which senior DoD officials and their staffs addressed critical mobilization measures which might be implemented during a crisis. This effort served to enhance the ability of the DoD crisis management team to understand better the dynamics of executive leadership processes. Another such exercise is envisioned to reacquaint the federal mobilization community-at-large with the essential elements of defense-related decision-making. This exercise will be conducted in conjunction with PROUD EAGLE 90 in the fall of 1989. During PROUD EAGLE 90 we intend to exercise the major issues associated with non-combatant evacuation, civilian mobilization, and our national accession policy.

3. Deploying the Force

a. Force Projection Goals

We assess our ability to project forces through an aggregate measure that includes airlift, sealift, and prepositioned equipment, munitions, and supplies. Our goal is to have sufficient force-projection capability to deploy forces to oppose successfully a Soviet threat in a region such as Southwest Asia (SWA) without sacrificing the ability for initial reinforcement of Europe and the Pacific, or to engage in a war to oppose concurrent Soviet-bloc operations in these areas. Deployments to Europe (because of the size of the forces involved) and to SWA (because of the distances that must be covered) are by far the most demanding aspects of this dual task.

(1) Europe

Since 1978, the United States has been committed to the reinforcement of NATO, within ten days of a decision to do so, with six additional Army divisions, 60 additional tactical fighter squadrons, and one Marine Expeditionary Brigade (MEB), plus supporting units for all of these forces. To meet this schedule, we must preposition the majority of the equipment for these units in Europe, together with the munitions and supplies needed to sustain operations until sea lines of communication can be established. Should war come, the troops and some remaining equipment would deploy by air, draw their prepositioned equipment, and move to wartime locations much more quickly than whole units could be deployed by either air or sea. Once the initial deployment was complete, U.S. sealift, augmented by allied shipping, would deploy follow-on forces, as well as the majority of the materiel needed to sustain the conflict.

(2) Southwest Asia

As the events of the past year have made clear, there are a variety of threats to our interests in SWA that could necessitate the deployment of forces. Of these, an invasion by Soviet forces located in close proximity to the region would be the most demanding for our mobility forces. The Soviet advantage is tempered somewhat, however, by the long distances their forces would have to travel over an austere road and rail system to reach the key oil-producing regions. Therefore, with prompt action on timely warning, we should be able to succeed in thwarting a Soviet advance.

Our strategy in such a scenario includes the deployment of a major joint task force within six weeks of a request for assistance by nations of the region. Air defenses would have to be established in the early stages of the deployment, and ports and airfields would have to be secured to receive follow-on forces. In addition to whatever naval forces might have been sent to the area as the crisis developed, we would rely on airlift, combined with prepositioning, to provide the forces for these early tasks. Heavy combat and support forces would follow on fast sealift, and the remainder of the deployment would be conducted by conventional sealift.

We continue to rely heavily on prepositioning afloat in SWA. Afloat prepositioning was planned initially to overcome access limitations in peacetime, but it also permits the rapid movement of some items to operating locations in wartime. In addition, it gives us the flexibility to use the materiel in other theaters. Indeed, most of the mobility programs that have grown out of the need to respond to a crisis in SWA have improved our capability to deploy to any region of the world, particularly to austere environments.

b. Force Structure Goals

Our intertheater mobility objectives have been derived from these theater goals plus plans for the support of forces in the Pacific. Aggregate airlift and sealift goals were determined on the basis of the total capacity required to accomplish mobility missions, adjusted to reflect the contribution we could reasonably expect from allies. The goals include:

- Sixty-six million ton-miles-per-day (MTM/D) of cargo airlift;

- Sealift capacity for one million tons of noncontainerizable unit equipment;

- Prepositioning in Europe of the equipment required by most of the forces to be deployed in the first ten days of a conflict;

- Prepositioning afloat of equipment and supplies for three Marine Expeditionary Brigades; and

- Prepositioning in SWA of equipment and support for early-deploying forces. In all theaters, our goal is to preposition some bulk supplies needed early in a crisis, and respond immediately with airlift until deliveries can begin by sea.

c. Assistance from Allies

Our success in any worldwide conflict remains dependent on allied support of our force deployments. Ships and passenger and cargo aircraft provided by the NATO allies would be indispensable in a U.S. reinforcement of Europe, and Korean shipping would make a modest but useful contribution to a reinforcement of that country. Our commitment to reinforce NATO has been matched by an allied commitment to make prepositioning assets eligible for infrastructure funds, to provide land for warehouses, and to expand host-nation support.

Access provided to various bases by our allies and friends contributes significantly to collective defense efforts. Not only does it enable crucial supplies to be prepositioned, but it provides critical stopover points for our forces en route to a contingency and is an essential element of our forward-basing strategy. We hope, therefore, that ongoing base negotiations in both Europe and Asia will succeed in providing continued access. No base, however, is irreplaceable, and where necessary, we will seek alternatives that continue to support our common defense objectives.

d. Accomplishments Since 1981

Much has been accomplished during this administration in improving U.S. force-projection capabilities. In airlift, we have purchased 50 additional C-5 aircraft and 44 additional KC-10s, all of which will be delivered by the end of this fiscal year. We also have modified, or contracted to modify, 23 civilian passenger aircraft to a cargo-convertible configuration. Our NATO allies have increased their allocation of civilian cargo aircraft to 40 and have committed 69 civilian passenger aircraft. In sealift, we have procured and modified eight fast sealift ships, expanded the Ready Reserve Force (RRF) from 24 to 91 ships, and funded enough sea sheds and flat racks to convert 25 containerships to carry the full range of unit equipment. These increases in sealift have been offset in part by a continued decline in the U.S.-flag fleet; nevertheless, our overall capacity for moving units by sea has increased.

Equipment and supplies for three MEBs have been afloat in the Atlantic, Pacific, and Indian Oceans since 1986 on 13 maritime prepositioning ships, and we have expanded other prepositioning ships in SWA from two to 12.

In Europe, the NATO alliance has completed construction of the warehouses originally requested for prepositioning materiel configured in unit sets (POMCUS) for the Army, and we have expanded the equipment stored there from less than 200,000 to nearly 500,000 tons. Prepositioning for Air Force units throughout Europe under the Prepositioning Procurement Package is about 80 percent funded and 50 percent in place. Prepositioning for the MEB in Norway will be substantially completed this year. Chart III.D.3 offers a quantitative measure of the combined contributions of prepositioning, airlift, and sealift to our ability to conduct a large-scale, multitheater deployment. The comparisons reflect where we were at the beginning of this administration, where we are now, and where we will be at the end of the program period, assuming congressional support of our force-enhancement efforts.

e. The Tasks that Remain

In FY 1989, our airlift fleet will achieve the capacity to carry 46 million ton-miles of cargo a day, up

from 30 million at the beginning of the decade. With continued support from the Congress for the C-17 program, we will reach our full 66 MTM/D goal by the turn of the century. Tasks that remain include providing the airlift fleet with defensive suites, enhancing communications capabilities, and procuring adequate spare parts and material-handling equipment.

Attaining and maintaining an adequate sealift capability is, perhaps, the most difficult task that remains. A continued decline in commercial sealift capacity due to market forces is expected in both the U.S. and NATO merchant marines. We have reevaluated the number of ships we would need from our NATO allies in a major deployment and are working with them to expand their contribution. The congressionally chartered Commission on Merchant Marine and Defense is exploring solutions to the decline in U.S. sealift, as is the National Security Council, and DoD is actively involved in both efforts.

Two programs being continued in this budget will expand or maintain the type of sealift in shortest supply -- capacity to carry noncontainerizable unit equipment. First, we are continuing our program to enhance containerships for such use. The projected decline in this type of ship limits the number available, as does the fact that these same ships are also needed to move large quantities of containerizable equipment, ammuni-

Strategic Mobility Surge Capability

Chart III.D.3

NOTE: Based on 30 days of airlift operations and a single sailing of the sealift fleet.
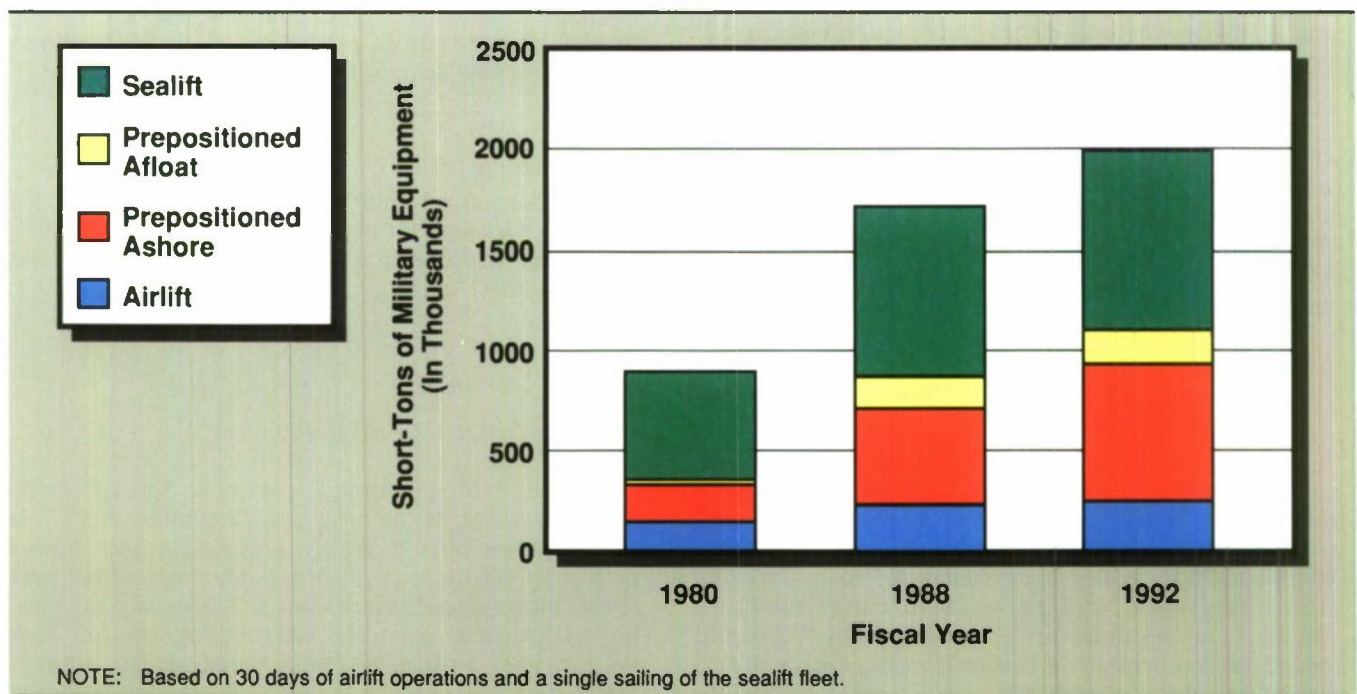
tion, and resupply items. Second, the Department of Transportation is continuing to expand the Ready Reserve Force (RRF) with ships leaving commercial service. Although responsibility for procurement and maintenance of the RRF has been transferred from the Department of Defense to the Department of Transportation, the RRF remains a vital part of our mobility forces. A memorandum of agreement between the Maritime Administration and the Military Sealift Command governs operation of the fleet, and procedures have been established for coordinating program development.

In response to congressional direction, the Navy is investigating the feasibility of developing very fast large sealift ships, and some studies have already been completed. We will fully evaluate the cost-effectiveness of such ships and develop programs to fund them, if appropriate.

An ability to offload ships in austere locations is essential if we are to be able to deploy forces to the most likely trouble spots in the years to come. Several programs now under way will provide such a capability, and I urge the full support of the Congress for them.

Despite the substantial investment we have made in equipment prepositioning in Europe, much remains to be done to meet fully our reinforcement commitment. During the past year, we completed a major study that identified several steps that could be taken in the near term to improve our ability to deploy forces rapidly to Europe, such as improving the organization and storage of equipment that is already prepositioned on the continent.

One of the most challenging parts of the rapid reinforcement task is providing adequate support to our combat forces at the outset of a conflict. Opinions differ as to how much is enough and what can be obtained from host nations, but there is general agreement that POMCUS will have to be provided for more U.S. support units. Investment in additional support equipment is essential to success, since many of the items needed for POMCUS are in short supply throughout the Army.

Due to limitations imposed by host governments on access to land-based storage sites in peacetime, we cannot predict when we will reach our prepositioning goal in SWA. The Commander in Chief of the U.S. Central Command (CINCCENT) has been able to make slow gains in this regard, and the successful end of the Iran-Iraq War may result in further opportunities. While we seek expanded access, we continue to rely on ships for storage of vitally needed materiel. Some combination of land-based storage and greater prepositioning afloat is necessary to meet CINCCENT's needs.

We often have described the mobility "triad" of airlift, sealift, and prepositioning; but there is a fourth component that is equally important -- the command, control, and communications (C^3) systems that enable us to plan and execute deployments. The U.S. Transportation Command has moved aggressively since its creation in 1987 to define a C^3 architecture, and to ensure that the requisite programs are adequately funded. Continued support of these programs is essential if we are to be able to use our mobility forces to their full potential.

4. Defense Program Update

a. Airlift

(1) C-17

Production of the C-17 began in FY 1988 and continues this year. Our budget request for FY 1990 and FY 1991 continues procurement on the previously planned schedule.

(2) Other Programs Supporting Airlift

The Air Force has initiated a program to place defensive systems on airlift aircraft. Within a common framework, specific warning devices and countermeasures will be selected for each aircraft based on the anticipated threat. Aircraft expected to face the highest levels of threat will be equipped first. The FY 1990-91 budget also continues procurement of material-handling equipment (MHE) for the airlift fleet.

b. Sealift

The budget continues procurement of sealift discharge equipment for the Navy and Army, including such items as floating and elevated causeways, utility landing craft, cranes, and other container-handling equipment.

c. Command, Control, and Communications

Elements of the Joint Deployment System are the most important of the programs to enhance the C^3 capability of mobility forces. In addition, the Air Force is providing secure, jam-resistant communications gear for its airlift aircraft (including KC-10s), and the Navy has undertaken to ensure that communications links are provided between all sealift vessels and naval commands.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
C-17 Cargo Aircraft				
Development:				
$ Millions	1,090.5	932.0	915.2	498.4
Procurement:				
Quantity	2	4	6	10
$ Millions	666.2	1,099.3	1,979.3	2,595.7

5. Conclusion

Programs for the mobilization and deployment of our forces continue to enjoy a high priority among the needs of the commanders in chief of the unified and specified commands. With the strong support of the Congress, we have vastly expanded the capability that existed in 1981, moving a long way toward the goals established early in this administration. Yet much remains to be done. As we prepared the FY 1990-94 program and this budget, we reaffirmed those goals even in the face of lower budgetary expectations. I urge continued support for the timely completion of ongoing programs, especially those involving C^3 and support equipment, that ensure we can fully utilize the airlift and sealift platforms we have procured and the materiel we have prepositioned.

E. SPECIAL OPERATIONS FORCES

1. Introduction

Special Operations Forces (SOF) fulfill a vital role in protecting our national security interests. Their capabilities can be employed in peace and at all levels of conflict, independently or in concert with other forces. In peacetime, SOF, in conjunction with other military forces, can apply the military element of national power indirectly by participating in security assistance, civic action, foreign internal defense, and humanitarian assistance operations. SOF also play a key role in contingency operations, whether employed unilaterally or as part of a larger conventional force. The value and importance of SOF capabilities have been clearly demonstrated in operations that restored democracy to Grenada and protected U.S.-flagged and allied shipping in the Persian Gulf.

At higher levels of conflict, SOF can act as a significant force multiplier for conventional missions by conducting operations to delay, divert, or disrupt enemy forces or by collecting information concerning enemy intentions.

Recognizing the contribution SOF make in protecting our national security interests, our goals have been: first, revitalizing SOF capabilities to enable them to perform their missions in times of peace, crisis, or war; and second, to program for the sustainment and modernization of these forces.

Over the past nine years, we have made significant progress in attaining these goals. As shown in Chart III.E.1, since 1981 we have invested more than $11.8 billion in improving our SOF capabilities and have programmed another $8.4 billion toward sustainment and modernization. In addition to expanding force structure and capability significantly, we have activated the U.S. Special Operations Command (USSOCOM), established the position of Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict, and established special operations commands in each of the regional theaters.

2. Readiness

During this administration, the capabilities of our nation's SOF have been enhanced significantly. In addition to an expanded force structure (see Table III.E.1) and more airlift (see Table III.E.2), there has been progress in equipping SOF with weapons, aircraft, and modernized special equipment to fulfill their

SOF Funding
(FY 1981 - 92)

Chart III.E.1
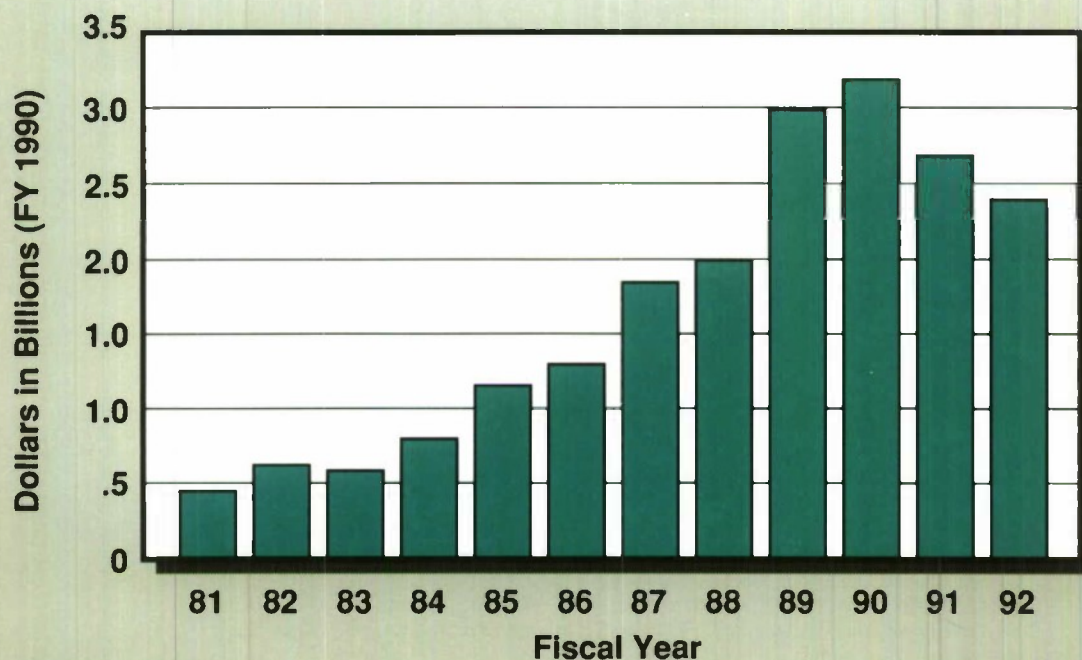
Major SOF Expansion
(FY 1981 - 92)

Table III.E.1

	FY 1981	FY 1988	FY 1992
Special Forces Groups[a]	7	8	9
Ranger Battalions	2	3	3
Psychological Operations Battalions[b]	3	4	4
Civil Affairs Battalions[b]	1	1	1
SEAL Teams	3	6[c]	7[c]
SEAL Delivery Vehicle (SDV) Teams	0	2[c]	2[c]
Special Boat Units	6	7[d]	7[d]
Special Operations Wings	1	2	3
Special Operations Aviation Group	0	0	1
Total	**23**	**33**	**37**

[a] Includes four Reserve Component groups.
[b] Includes Active Components only.
[c] Includes two underwater demolition teams redesignated in 1983.
[d] Includes four Reserve Component units.

SOF Primary Aircraft Mix
(FY 1981 - 92)

Table III.E.2

	FY 1981	FY 1988	FY 1992
Air Force			
MC-130E/H Combat Talons	14	14	32
AC-130A/H/U Gunships[a]	20	20	20
MH-53H/J Pave Low Helicopters	9	19	41
CV-22 Ospreys[b]	0	0	0
EC-130 Volant Solos	4	4	4
HC-130 Tankers (SOF-dedicated)	0	8	31
C-141s Special Ops Low Level II (SOLL-II)	0	0	13
C-130s SOLL-II	0	0	11
Total	**47**	**65**	**152**
Army			
MH-60K Helicopters	0	0	20
MH-47E Helicopters	0	0	36
MH-60A Helicopters	0	45	40
CH/MH-47D Helicopters	0	16	12
UH-1 Helicopters	0	23	0
AH/MH-6 Helicopters	29	54	36
Total	**29**	**138**	**144**

[a] Includes ten AC-130A Air Force Reserve gunships in FY 1981 - 87. FY 1992 number reflects decommissioning of AC-130As and addition of 12 AC-130U aircraft.
[b] First deliveries will not begin until FY 1995. Total to be procured for SOF will be 55.

missions. Perhaps the most significant advance, in view of SOF expansion, has been the continued recruitment and training of highly disciplined, resourceful, and responsive soldiers, sailors, and airmen who are exceptionally proficient across the full spectrum of war.

Today our SOF stand better prepared than ever before to execute missions assigned them. Some deficiencies, however, remain and must be resolved before SOF revitalization, sustainment, and modernization goals can be completely achieved. These deficiencies have been recognized and programs implemented to resolve them.

3. Force Structure and Composition

USSOCOM is a unified command headquartered at MacDill Air Force Base, Florida. The major force components of USSOCOM are shown in Chart III.E.2. These forces are organized into a wide variety of units, including the Army's Special Forces, Rangers, Psychological Operations, Civil Affairs, and Special Operations Aviation units; the Navy's SEAL and SEAL Delivery Vehicle Teams and Special Boat Units; and the Air Force's 23d Air Force SOF units.

USSOCOM's principal function is to prepare its forces for employment under the operational command of the regional theater commanders. USSOCOM is also responsible for conducting special operations when directed by the National Command Authorities. The Command is also responsible for developing SOF strategy, doctrine, and tactics, as well as training and education. The Commander in Chief, USSOCOM is responsible for the development and acquisition of SOF-peculiar equipment, materiel, supplies, and services and is working to establish the systems he needs to utilize his Head of Agency acquisition authority to fully carry out this responsibility.

4. SOF Initiatives

In the short time since its activation, USSOCOM has made tremendous progress in institutionalizing SOF and accomplishing major SOF initiatives, including:

- An acquisition strategy to determine SOF-peculiar acquisition procedures, functions, and responsibilities, and to develop an organizational structure

SOF Force Structure

Chart III.E.2

USSOCOM MACDILL AFB, FL			
(ARSOC) 1st Special Operations Command Ft Bragg, NC	**(NAVSOC)** Naval Special Warfare Command Coronado, CA	**(AFSOC)** 23d Air Force Hurlburt Field, FL	**(JSOC)** Joint Special Operations Command Ft Bragg, NC
5th SFG(A), Ft Campbell, KY	NSWG-2, NAB Little Creek, VA	71st SOS (AFR), Davis Monthan, AFB, AZ	
7th SFG(A) (-), Ft Bragg, NC	SEAL Team 2, 4, 6, &8, Little Creek, VA	1st SOW, Hurlburt Field, FL	
4th PSYOP Group, Ft Bragg, NC	SBR-2(NR), Little Creek, VA	8th SOS, Hurlburt Field, FL	
96th CA BN, Ft Bragg, NC	SBU-20 & 24 (NR), Little Creek, VA	16th SOS, Hurlburt Field, FL	
528th Support BN, Ft Bragg, NC	SDVT-2, Little Creek, VA	20th SOS, Hurlburt Field, FL	
112th Signal BN, Ft Bragg, NC	SBU-22 (NR), New Orleans, LA	1723rd Combat Control SQDN (SOCCT), Hurlburt Field, FL	
75th INF (RGR) REGT, Ft Benning, GA	SBU-26, Rodman, Panama	SO Weather Team (SOWT), Hurlburt Field, FL	
3d BN, 75th INF(RGR), Ft Benning, GA	NSWG-1, NAB Coronado, CA	193rd SOG (ANG), Harrisburg, PA	
10th SFG(A)(-), Ft Devens, MA	SEAL Team 1, 3, & 5, Coronado, CA	919th SOG (AFR), Duke Field, FL	
11th SFG(A)(USAR), Ft Meade, MD	SBR-1 (NR), Coronado, CA	711th SOS (AFR), Duke Field, FL	
12th SFG(A)(USAR), Arlington Hts, IL	SBU-11 (NR), NAS Mare IS, CA	39th SOW, Eglin AFB, FL	
1st BN, 75th INF(RGR), Ft Stewart, GA	SBU 12 & 13 (NR), Coronado, CA	9th SOS, Eglin AFB, FL	
20th SFG(A)(ARNG), Birmingham, AL	SDVT-1, Coronado, CA	55th SOS, Eglin AFB, FL	
160th AVN Group, Ft Campbell, KY	NSWU-1, Subic Bay, RP	1724th Special Tactics Squadron, Pope AFB, NC	
19th SFG(A)(ARNG), Salt Lake City, UT	NSWU-2, RAF Machrihanish, UK	67th SOS, RAF Woodbridge, UK	
1st SFG(A)(-), Ft Lewis, WA	NSWU-4, Roosevelt Roads, PR	21st SOS, RAF Woodbridge, UK	
2d BN, 75th INF(RGR), Ft Lewis, WA	NSWU-8, Panama	1st SOS, Clark AB, RP	
1st BN, 10th SFG(A), Bad Toelz, FRG		7th SOS, Rhein-Main AB, FRG	
1st BN, 1st SFG(A), Torii Station, Okinawa			
3d BN, 7th SFG(A), Ft Davis, Panama			

that is functionally aligned with the DoD acquisition system;

- A Joint SOF Baseline Master Plan and associated action plans which set forth goals of the command in carrying out its responsibilities and functions;

- A Joint Mission Analysis, scheduled for completion by 4th quarter 1990, that will assist in the development of doctrine, strategy, and requirements for global application of SOF;

- A worldwide SOF Intelligence Architecture which emphasizes interoperable intelligence systems and intelligence requirements; and

- A joint SOF readiness study that provides a baseline assessment of all SOF readiness. Other major initiatives are shown in Table III.E.3.

5. Conclusion

We are making substantial progress in restoring a special operations capability commensurate with the role SOF play in protecting our national security interests, and in integrating that capability into our overall force structure. Funding levels for SOF have been increased significantly, not only for immediate revitalization initiatives but for sustainment and modernization

as well. In addition to creating the U.S. Special Operations Command we have also expanded the special operations force structure. Our SOF aircraft mix has likewise expanded considerably and more is programmed.

Much has been accomplished to date; however, much still needs to be done. We continue to work toward remedying shortfalls and deficiencies as we also plan for the future. The CV-22 tilt-rotor aircraft, which will enter service with SOF in the mid-1990s, will improve greatly our capacity for infiltration, exfiltration, and resupply of deployed forces in target areas beyond the capability of current aircraft. It will also provide an effective exfiltration counterpart to the MC-130 Combat Talon's deep-infiltration capability. Similarly, introduction of the SEAL tactical insertion craft (STIC), the advanced SEAL delivery system (ASDS), and continued deployment of dry deck shelters (DDS) and DDS-capable submarines will broaden our sea-based infiltration and exfiltration capability.

As a result of our revitalization efforts, our SOF today present a much more capable force available for employment throughout the conflict spectrum. With the continued interest and assistance of the Congress, we will achieve our ultimate goal of completely restoring a national SOF capability and modernizing it for the future.

Major FY 1990 SOF Initiatives

Table III.E.3

Army
Activate a fifth special forces group, the 3d Special Forces Group (Airborne).
Create a theater Army special operations command for each regional unified command.
Modify 11 CH-47s to MH-47E configuration.
Modify 11 MH-60Ks.

Navy
Modify 10 MK VIII SEAL delivery vehicles (SDV).
Begin development of SEAL tactical insertion craft (STIC).
Begin development of advanced SEAL delivery system (ASDS).
Continue naval special warfare master plan growth.
Continue dry deck shelter (DDS) construction and SSN conversion program.
Procure 7 HH-60s for helicopter composite squadrons (HCS).
Procure last riverine craft and first coastal patrol boat.

Air Force
Procure last 5 AC-130Us.
Continue the development of the CV-22.
Complete modification of 41 H-53s to MH-53J, Pave Low configuration.
Procure last 2 MC-130Hs.
Modify HC-130s/C-130s/C-141s to SOF configuration.

F. NUCLEAR FORCES AND STRATEGIC DEFENSES

1. Introduction

a. Force Rationale

The strategic modernization program has been one of the highest priorities of this administration. Its prominence is due to the vital role that U.S. nuclear forces play in deterring attacks or attempts at coercion against the United States or its allies. Should deterrence fail, the mission of our strategic forces would be equally vital: to control escalation, and to terminate the conflict at the lowest possible level of violence.

b. Force Structure and Disposition

The forces discussed in this chapter are divided into four categories: strategic offensive forces; strategic defensive forces; command, control, and communication (C^3) systems; and nonstrategic nuclear forces.

Not only has our triad of strategic offensive forces been maintained, but the proportion of modernized platforms and weapons in each of the three triad components -- strategic bombers, intercontinental ballistic missiles (ICBMs), and submarine-launched ballistic missiles (SLBMs) -- has increased dramatically during this administration. Programs now under way will continue this modernization through much of the next decade. Chart III.F.1 shows the evolution of our inventories of bomber-, SLBM-, and ICBM-delivered weapons.

Strategic bombers can carry nuclear gravity bombs, short-range attack missiles (SRAMs), or air-launched cruise missiles (ALCMs). ICBMs and SLBMs carry multiple independently targetable warheads, except for the Minuteman II, which has a single warhead. Chart III.F.2 shows the locations of our strategic offensive forces.

Strategic defensive forces include ground-based surveillance systems that warn of bomber or cruise missile attacks and air defense systems that help defend against such attacks. Our ground-based surveillance radars are positioned along the periphery of North America and in selected northern locations, where they would warn of a Soviet missile or bomber attack. Also, as part of our strategic defense program, the Strategic Defense Initiative is exploring technologies for providing a defense against ballistic missile attack. The Air Defense Initiative will concurrently explore and devel-

Strategic Offensive Force Structure
(Inventory of Warheads)

Chart III.F.1
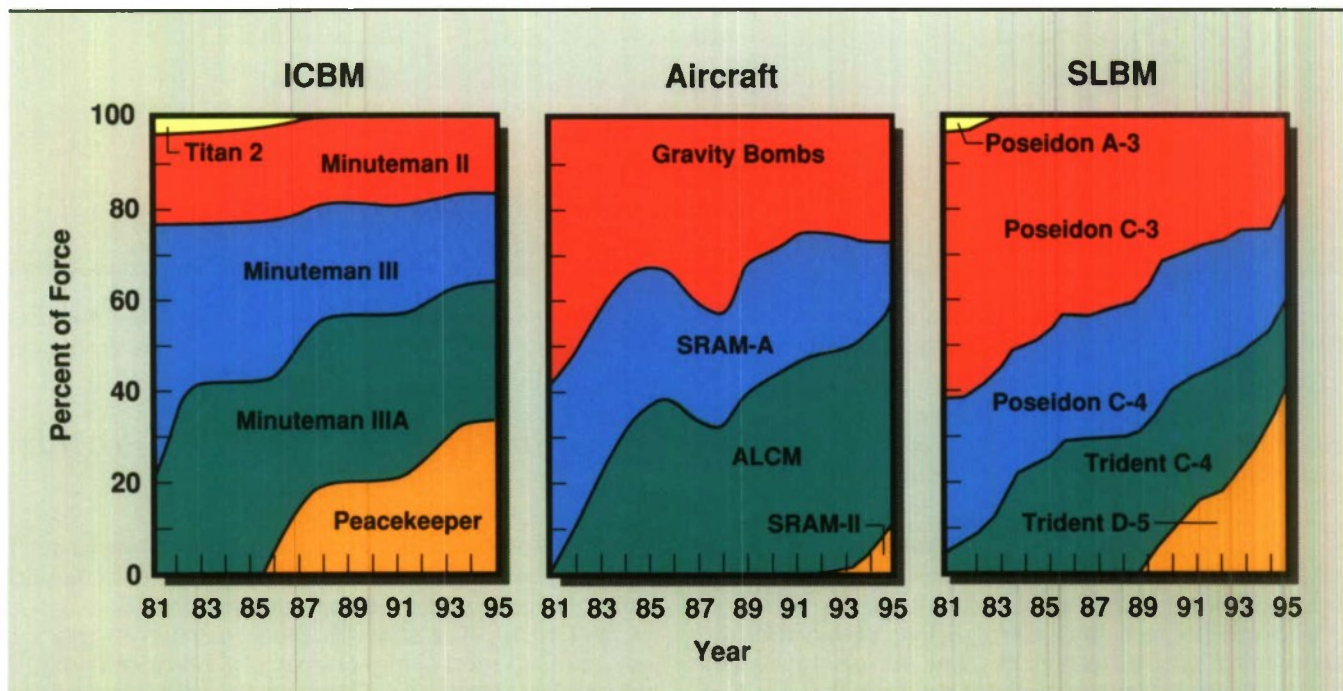
Locations of U.S. Strategic Offensive Forces

Chart III.F.2

Note: Effective October 1, 1988, the B-52 squadrons at Loring AFB, Mather AFB, Andersen AFB, and one squadron at Barksdale AFB were assigned a dedicated conventional bomber role.
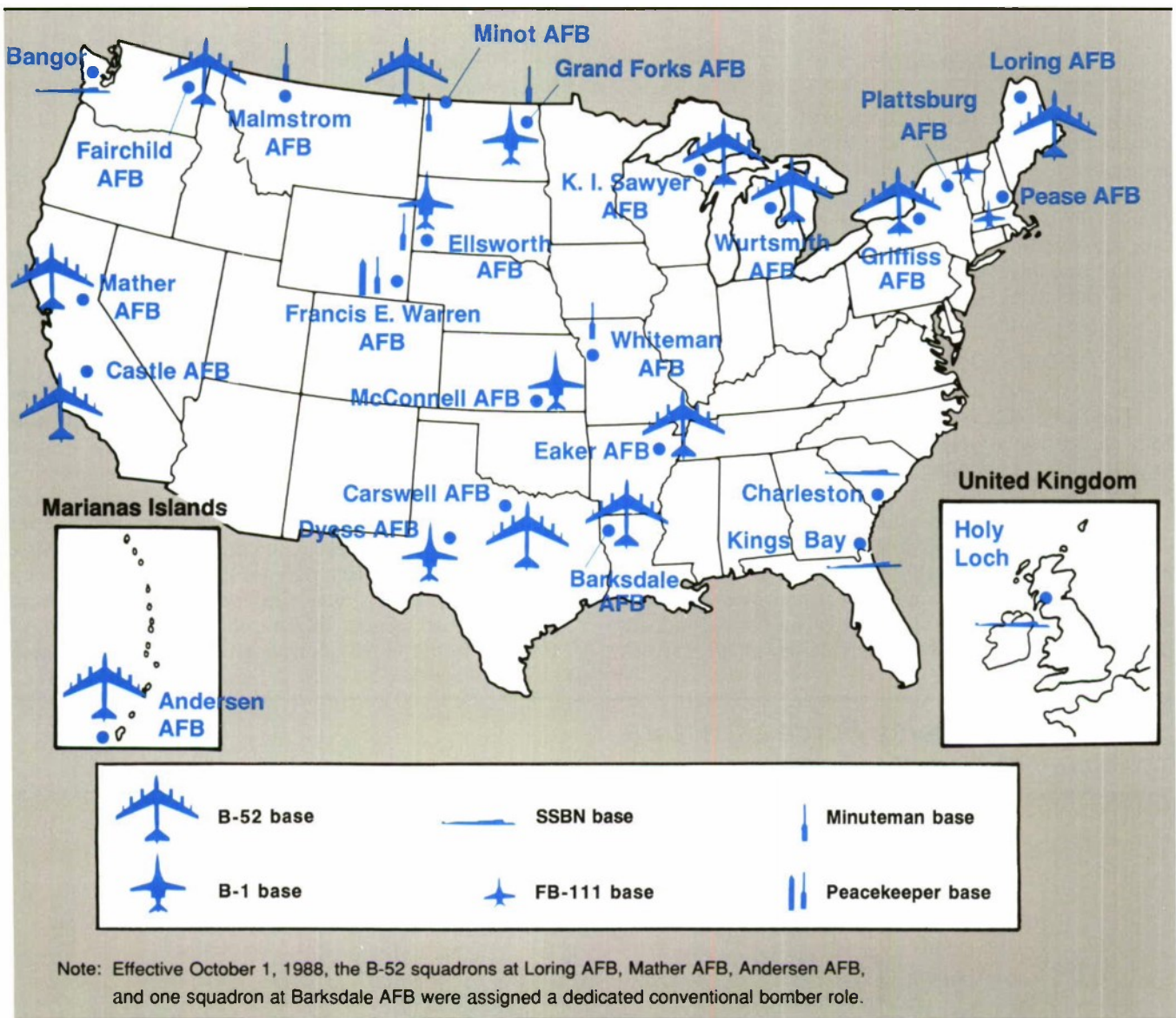
op technologies needed to improve the air defense of North America, thus complementing the SDI program.

C^3 support is provided by space- and ground-based communication systems that link warning sensors to command centers and command centers to the forces.

Nonstrategic nuclear forces consist of land- and sea-based systems designed for short- or intermediate-range strikes. These systems include sea-launched cruise missiles, gravity bombs delivered by aircraft, short-range artillery projectiles, and surface-to-surface Lance missiles. They are based in the United States (for rapid forward deployment in time of crisis), on naval platforms at sea, and with our forces in designated theaters of operation.

c. Strategic Modernization Program Goals

Our forces and associated C^3 systems must be sufficiently ready, sustainable, and survivable to accomplish their peacetime and wartime missions, as discussed in Chapter I.C. The strategic modernization program is designed to meet that requirement, and in so doing, to strengthen deterrence. The program is also intended to

end the relative erosion of U.S. strategic capabilities vis-a-vis the Soviet Union and to put the United States in a position to maintain its capabilities in the wake of anticipated improvements in Soviet forces. To achieve these ends, the program has been structured to include five mutually reinforcing elements. They are to:

- Improve our command, control, and communications systems;

- Modernize strategic bombers and the weapons they carry;

- Deploy new and more accurate submarine-launched missiles;

- Improve the capability and accuracy of our land-based missiles, and reduce their vulnerability; and

- Improve strategic defenses.

d. Summary of Progress, 1981-88

When this administration entered office in 1981, we surveyed the condition of U.S. strategic forces. The results were quite disturbing:

- Our ICBMs lacked the effectiveness to threaten retaliation against the increasing number of hardened

Soviet assets, and significant increases in Soviet ICBM capabilities had made our ICBMs vulnerable to a Soviet first strike.

- The bomber force consisted of only B-52 and FB-111 aircraft that would have had to penetrate an increasingly lethal Soviet air defense system to carry out their strike mission.

- Our ballistic missile submarines -- almost all of which were built from 1962 to 1966 -- faced block obsolescence within a decade, and their missiles would not be effective against hardened targets.

- Our C^3 systems lacked the survivability and endurance necessary to support our nuclear strategy and our nuclear forces.

The modernization program that began in 1981 followed a 15-year period during which the United States exercised restraint while Soviet forces were expanded and modernized. In spite of the extensive upgrades required, our offensive and defensive strategic programs have constituted, on average, only 12 percent of the total defense budget during the Reagan Administration. Furthermore, modernization of our forces has occurred without significant growth in the percentage allotted to strategic programs. Chart III.F.3 compares the portion of defense funding used for strategic pro-

Strategic Program Funding
(FY 1962 - 89)

Chart III.F.3
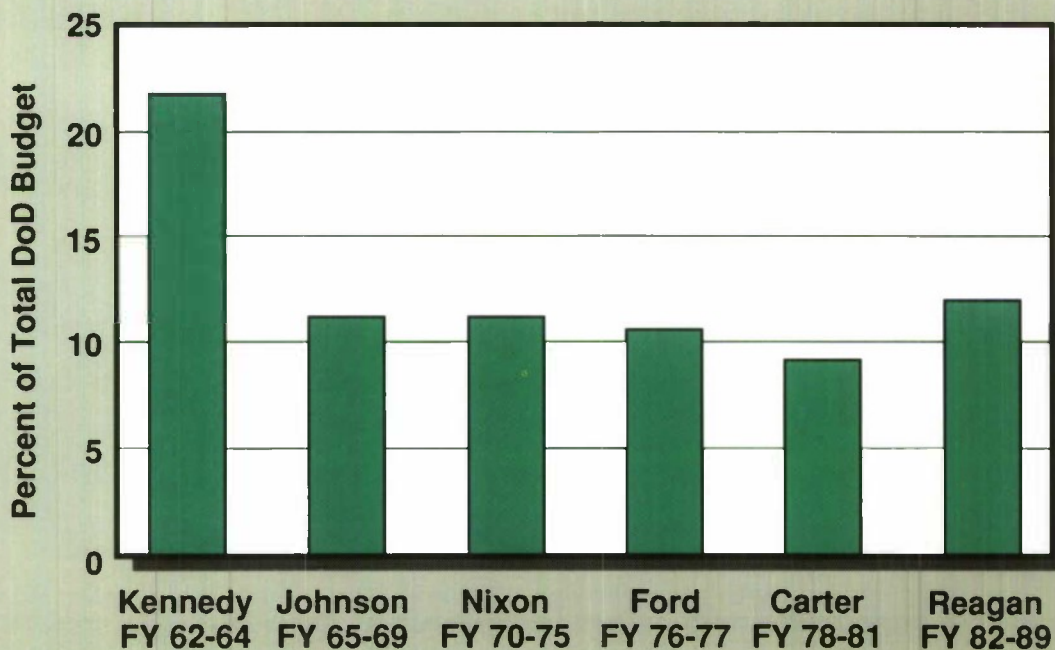
grams during this administration with that of previous administrations.

(1) Offensive Systems

The results of the force modernization have been impressive. Although the number of bombers, ICBM launchers, and ballistic missile submarines has remained relatively constant since 1980, a portion of each component of the strategic Triad has been modernized. Our forces are becoming more survivable, the number of available weapons has increased, and the accuracy of the weapons' warheads has improved. The milestones achieved are summarized in Table III.F.1.

(a) Survivability

The survivability of the ICBM force will be enhanced with the introduction of mobile basing modes in the early 1990s. The in-flight survivability of our strategic bombers has already increased in two ways. First, the deployment of standoff weapons, such as ALCMs, has allowed bombers to perform their strike missions while avoiding heavily defended airspace, or to launch their ALCMs prior to, or instead of, performing penetration missions. Second, the deployment of a new penetrating bomber (the B-1B), which will be augmented in the 1990s by the advanced technology bomber (the B-2), has provided the force with aircraft that are hardened to the effects of nuclear weapons and have quick reaction and takeoff capabilities. These characteristics would enhance the aircraft's survivability in an attack on our bomber bases.

The aging fleet of Poseidon SSBNs is being replaced by a more capable, but perhaps numerically smaller, fleet of Trident submarines. The Trident is much quieter than the Poseidon and, when equipped with the D-5 missile, it will have the potential to operate in an expanded patrol area. It also incorporates new countermeasures against possible Soviet developments in antisubmarine warfare. These improvements will help ensure the effectiveness and survivability of the sea-based leg of the Triad into the 21st century.

(b) Increase in Modernized Weapons

The number of modern, more capable weapons in the U.S. inventory has steadily increased during the 1980s. Peacekeeper missiles have been deployed in silos that formerly held Minuteman systems. The Peacekeepers carry more warheads than the Minuteman missiles they replaced, and their warheads are also much more accurate. The accuracy of the remaining Minuteman missiles, particularly the Minuteman III, has also improved. The deployment of ALCMs on existing B-52 bombers has increased the number of air-

Strategic Modernization Program Milestones Achieved (1981 - 88)

Table III.F.1

- 100 B-1B bombers deployed.

- 75 B-52D bombers retired.

- Approximately 1600 air-launched cruise missiles deployed on B-52s, and the Advanced Cruise Missile (ACM) under development.

- B-2 bomber under development.

- 8 Trident SSBNs deployed, with 5 of the older Poseidon submarines retired.

- Trident II (D-5) missile development on schedule, with the first Trident II (D-5) SSBN planned to become operational in December 1989.

- 50 Peacekeeper missiles deployed in existing Minuteman silos, and full-scale development begun of rail-garrison basing.

- 52 older Titan II ICBMs retired.

delivered weapons in the U.S. arsenal. The ALCM and improvements in aircraft navigation systems have led the overall increase in the accuracy of bomber-delivered weapons. All Trident submarines will eventually be armed with the D-5 missile. The D-5 offers improved accuracy and greater range for equivalent payloads than our current SLBMs and can also carry a higher-yield warhead.

The deployment of these more capable weapons has strengthened our confidence that we can effectively place at risk vital assets of any potential adversary. This growth in capability also provides a hedge against potential technological breakthroughs or arms control violations that could threaten a portion of the Triad.

(c) Hard-Target-Kill Capability

One of the most notable achievements of the strategic modernization program has been the growth in our capability to destroy hard targets, such as command posts and missile silos. Today, the ICBM force provides our best prompt hard-target-kill capability. The bomber force is also extremely effective in this role but does not have the prompt capability. In the 1990s, with the deployment of the next generation of SLBMs, the sea-based leg of the Triad will also be capable of holding at risk hard Soviet targets.

For a small, but important, class of very hard targets, additional improvements are needed. We are developing earth-penetrating weapons as a means of attacking such targets. These weapons are essential if we are to be able to hold at risk the increasing number of deeply buried and hardened underground Soviet leadership facilities. Even our most effective ballistic missile weapons -- Peacekeeper and Trident II warheads -- lack the capability to destroy the deepest of these facilities. In addition, the extreme density of Soviet air defenses reduces our confidence in our ability to strike the most critical of those installations with existing aircraft-delivered weapons.

(2) C^3 and Defensive Systems

Significant progress has been made in improving U.S. C^3 systems. We have substantially upgraded the satellite and radar systems we rely on to warn of and assess ballistic missile attacks. We also have particularly improved our ability to communicate with our strategic offensive forces during an attack, immediately following an attack, and, if necessary, for extended periods thereafter. There have been notable successes in strategic defenses as well. New air surveillance radars and air defense aircraft have greatly enhanced our ability to detect and defend against bomber and cruise missile attacks. Research to provide defenses against ballistic missiles is also progressing extremely well.

The milestones achieved for strategic C^3 and defense programs are summarized in Table III.F.2.

2. FY 1990-94 Programs

a. Strategic Offensive Forces

(1) Intercontinental Ballistic Missile Forces

High alert rates and reliable supporting communications make ICBMs the most responsive element of the Triad. These characteristics allow ICBMs to strike targets whose timely destruction would be vital to disrupting enemy actions against the United States or its forces and to be retargeted rapidly in order to strike newly emergent targets. The Rapid Execution and Combat Targeting (REACT) program will further enhance these characteristics by upgrading the message-handling capabilities and computer systems of launch control facilities.

The first phase of the ICBM modernization program has focused on improving hard-target-kill capability and reliability through the deployment of Peacekeeper missiles in Minuteman silos and the comprehensive maintenance and upgrade of the Minuteman force. This phase was completed last year with deployment of the first 50 Peacekeeper missiles. Full operational capability was attained on schedule and below the projected cost. The 17 Peacekeeper flight tests to date have all been successful, demonstrating weapon system accuracy that far exceeds requirements.

The Minuteman force has served as the backbone of our land-based missile deterrent since its initial deployment in 1962. Over the years, the system continues to be upgraded to improve its accuracy and reliability, and it is expected to remain a major component of our deterrent capability well into the next century. This will require further augmentation of the maintenance program, however, particularly for the older Minuteman II system, to ensure acceptable levels of site maintainability and system reliability. Rocket motors and guidance computers may need to be replaced to correct age-related problems.

The next phase of the ICBM modernization program is to deploy the second 50 Peacekeepers in a rail-garrison basing mode. Chart III.F.4 shows how rail-garrison basing will work. Trains carrying two missiles apiece will be garrisoned in peacetime at existing Air Force bases, from which they could be dispersed over the rail network in times of national need. Rail-basing of the Peacekeeper will enhance our strategic posture significantly by providing a more survivable land-based system. This will degrade Soviet targeting

Strategic C^3 and Defense Modernization Milestones Achieved (1981 - 88)

Table III.F.2

Strategic Defense

- 3 of 10 Over-the-Horizon Backscatter (OTHB) radar sectors constructed.
- 15 new North Warning System radars deployed.
- F-106 air defense interceptors replaced with F-15s, F-16s, and F-4s.

Strategic C^3

- 2 additional PAVE PAWS ballistic missile warning radars deployed. Ballistic Missile Early Warning (BMEWS) radar in Greenland upgraded.
- Satellite Early Warning System upgrades developed and ready for deployment.
- 4 E-4Bs, the National Emergency Airborne Command Post (NEACP), deployed and based inland.
- EC-135 airborne command post upgrades in progress.
- Milstar satellite system development well under way.
- TACAMO E-6A aircraft in production.
- 56 Ground Wave Emergency Network (GWEN) nodes installed.

Peacekeeper Rail–Garrison Weapon

Chart III.F.4

Garrison

Dispersal on Rail Network
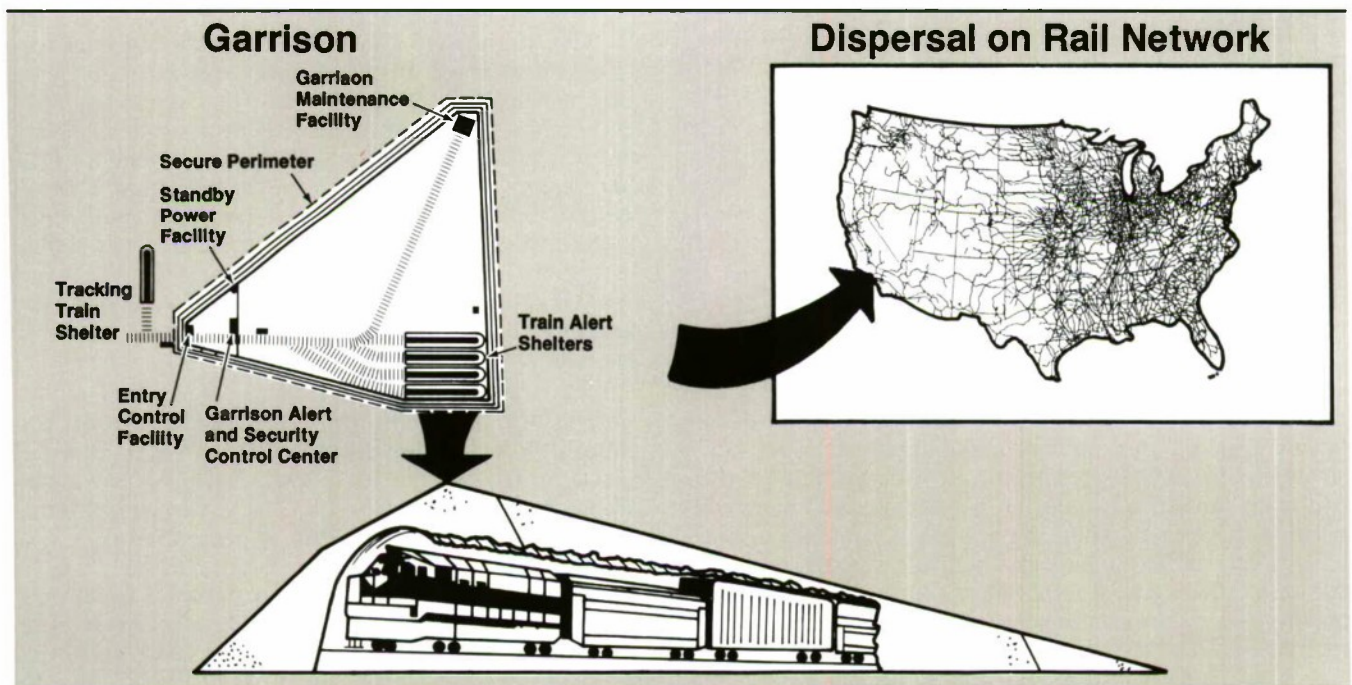
ability and, by making the results of a Soviet attack more uncertain, strengthen our nuclear deterrent. We plan for 50 Peacekeepers based in rail garrisons to be operational by the mid-1990s. Our long-term goal is to deploy 100 Peacekeepers in this basing mode, including the 50 initially deployed in silos. However, no funds have been programmed in FY 1990-94 for this rebasing.

The Peacekeeper program has been subjected to congressional action that has driven down the missile production rate to the minimum sustaining level of 12 per year, well below the optimum economic rate of 48 per year. This has raised unit costs substantially and has greatly extended the production period. It also will force us to scale back operational testing during the missiles' initial deployment in the rail-garrison basing mode.

The rail-garrison Peacekeeper, with its ten warheads per missile, was to be complemented by a road-mobile, single-warhead Small ICBM (SICBM). There are virtues in deploying both systems in terms of deterrence. In light of the current fiscal environment, however, this administration has concluded that we cannot afford both and that the Peacekeeper is the more cost-effective choice. We nonetheless agree with the Congress that the next administration should have the option to review this issue. Sufficient FY 1989 funding has been appropriated for the SICBM program to provide a basis for continuing the program, or some variation of it, if the next administration decides to do so. Because we have not proposed SICBM funding in the FY 1990-91 budget, a decision to continue the SICBM program would require budget adjustments for FY 1990-91.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
Peacekeeper Missiles and Silo Basing				
Development:				
$ Millions	35.7	40.0	14.8	7.4
Construction:				
$ Millions	5.6	-	-	-
Procurement:				
Quantity	12	12	12	12
$ Millions	873.7	796.6	1,129.7	942.3
Operations and Maintenance:				
$ Millions	11.6	31.6	68.2	82.5
Peacekeeper Rail-Garrison				
Development:				
$ Millions	322.8	588.4	774.2	544.1
Construction:				
$ Millions	3.5	13.2	219.1	317.1
Procurement:				
$ Millions	-	-	222.6	1,337.5
Minuteman				
Development:				
$ Millions	44.5	59.7	100.9	40.6
Procurement:				
$ Millions	83.5	69.1	93.6	240.9
Operations and Maintenance:				
$ Millions	143.6	141.9	134.7	128.0
Small ICBM				
Development:				
$ Millions	700.0	243.0	-	-

(2) Sea-based Strategic Nuclear Forces

The sea-based leg of the Triad -- our ballistic missile submarines -- is considered the most survivable. Modernization of this force has been one of the most successful elements of the entire strategic modernization program, with performance goals and milestones having been met consistently on schedule and within cost estimates. Programs include procurement of Trident ballistic missile submarines and development of the Trident II (D-5) missile.

In 1982, the first Trident submarine armed with the Trident I (C-4) missile began patrols. Today, we have eight of these submarines in operation. Funds for eight additional SSBNs have been authorized through FY 1989, and two more SSBNs are included in the FY 1990-91 budget request. These latter ten SSBNs will be armed with the D-5 missile. The eight Trident SSBNs now carrying Trident I missiles will be converted to carry the D-5 during scheduled overhauls beginning in the early 1990s. The D-5 will be the most accurate, versatile, and powerful weapon system ever carried by our SSBNs, enabling the sea-based leg of the Triad to strike hardened targets effectively for the first time.

Maintaining the current one-boat-per-year construction rate in the Trident program is vital, since these SSBNs are replacing the aging Poseidon SSBN force, which was built in the early 1960s. Five Poseidon submarines have been removed from operational status and retired since 1981, and all 26 that are still operational will need to be retired by the mid-to-late 1990s.

Three of these are being proposed for retirement in 1990 in place of the overhaul required that year. This action will save over $300 million in FY 1990.

Two years of flight testing have demonstrated that the Trident II missile program has been one of our most successfully managed acquisition efforts. Data from land tests indicate that all design goals will be met or exceeded, and at-sea testing will commence in early 1989. The system will achieve initial operational capability in December 1989, when the USS Tennessee, the first Trident SSBN to be armed with this system, starts its first scheduled patrol.

When at sea, our SSBNs are considered to be 100 percent survivable by all recent assessments and are projected to remain so against foreseeable threats. To guard against technological breakthroughs that could threaten at-sea SSBNs, we will maintain an active SSBN survivability program.

(3) Strategic Bomber Forces

Bombers are a highly flexible leg of the strategic Triad, capable of being recalled or redirected while en route to their targets. They are able to attack fixed strategic targets, and they can perform damage-assessment missions following earlier strikes by U.S. forces, and reconstitute for follow-on missions. They can also hold at risk mobile military targets that are critical to Soviet wartime objectives. In addition to their primary nuclear mission, long-range bombers can be used to support conventional ground and naval operations worldwide.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
Trident SSBN				
Construction:				
$ Millions	127.2	56.3	58.9	69.1
Procurement:				
Quantity	1	1	1	1
$ Millions	1,281.7	1,219.4	1,251.1	1,275.0
D-5 Missile				
Development:				
$ Millions	1,037.9	574.8	222.2	70.7
Procurement:				
Quantity	66	66	63	52
$ Millions	2,041.3	1,865.6	1,816.3	1,536.9

At the beginning of this decade, our strategic bomber force consisted of aging B-52 aircraft and some shorter-range FB-111s with limited payload capability. The President's strategic modernization program for the bomber force consisted of three main elements: the installation of air-launched cruise missiles (ALCMs) on B-52s, the deployment of 100 B-1B bombers, and the development of an advanced technology bomber (the B-2). To complement these improvements, programs have been undertaken to develop an advanced cruise missile (ACM) and a short-range attack missile (SRAM II) to be carried by the bomber force. Finally, the modernization effort also includes improvements to the tanker force that supports our strategic bombers.

ALCMs present difficult targets for enemy air defenses because of their relatively small radar cross sections and the low altitudes at which they fly. They have prolonged the useful life of the B-52 force by giving it the capability to hold targets at risk without penetrating Soviet air defenses. We now have 98 B-52G and about 70 B-52H aircraft equipped for cruise missile carriage. All B-52H aircraft will be equipped to carry cruise missiles externally by the end of FY 1989; rotary launchers required for internal cruise missile carriage will be available for the entire B-52H force in FY 1993. With the deployment of the B-1B and B-2 bombers, all of the B-52G force will eventually be retired from its present nuclear-strike mission, and the B-52H force will serve primarily as cruise missile carriers. A portion of the B-52Gs have been withdrawn from strategic service and are being retained for use in a conventional role.

We are developing the ACM to counter projected improvements in enemy air defenses. The ACM will be more accurate and will be able to operate at longer ranges than the existing ALCM-B. This extra range will allow bombers to deliver their weapons at greater distance from enemy territory, thereby avoiding airborne warning systems and long-range interceptors that are expected to extend Soviet air defense coverage in the 1990s. The ACM's added range also enables the missile itself to circumnavigate some defenses. Low-observable technologies will enhance the missile's ability to penetrate and attack highly defended areas. The ACM will be deployed initially on B-52Hs at K.I. Sawyer Air Force Base.

The B-1B program has been a cornerstone of this administration's effort to modernize the strategic bomber force. In April 1988, the 100th B-1B was delivered to the Strategic Air Command (SAC), completing a critical phase of the modernization program. There are now six operational B-1B squadrons at four SAC bases.

The B-1B has significantly improved the capability of the bomber force to penetrate heavily defended areas and hold critical strategic targets at risk. Its ability to perform the most difficult penetration missions results from its advanced design and operational characteristics. The B-1B is capable of flying at high speed and low altitude and incorporates low-observable features that minimize exposure to enemy air defenses. A highly maneuverable aircraft, it employs advanced navigation systems that allow it to avoid many air defense elements. Finally, it is equipped with electronic countermeasures (ECM) for detection and electronic deception of air defense systems.

Except for certain ECM capabilities and the ability to perform low-altitude penetration when fully loaded, the B-1B aircraft has met, or exceeded, our expectations. Correcting these problems will not be a short-term effort, but programs are being implemented to remedy even the most serious deficiencies. Programs to improve the B-1B's flight control system are under way, and retrofits should be complete in the early 1990s. In addition, we have requested funds beginning in FY 1990 to provide a radar warning receiver and other countermeasures needed to augment the B-1B's defensive avionics system.

The development of the B-2 has been another key element in the bomber modernization effort. The B-2 incorporates revolutionary, state-of-the-art low-observable technologies to counter continuously evolving Soviet air defenses. Initial flight tests of the aircraft will occur in this fiscal year. The first B-2s will deploy to Whiteman Air Force Base in the early 1990s.

We are developing an improved nuclear short-range attack missile, the SRAM II, to replace the aging SRAM A and improve the effectiveness of the B-1B and B-2 force. These weapons provide a standoff capability that allows penetrating bombers to avoid terminal defenses and attack the most heavily defended strategic targets.

Aerial refueling is necessary if our bombers are to reach more distant targets and penetrate along routes that maximize survivability. We are continuing to pursue vigorously the KC-135 modernization program, which, when completed, will increase our aerial refueling capability by about 50 percent. In addition to re-engining KC-135s with new CFM-56 engines, the KC-135 program provides for safety and reliability modifications to the fleet. The FY 1990-91 budget procures support equipment and engines to modify 48 more aircraft.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
B-52 Bomber Modifications Procurement: $ Millions	247.2	209.6	218.7	74.3
B-1 Bomber Modifications Development: $ Millions	359.0	218.3	59.0	85.0
Procurement: $ Millions	14.5	24.5	73.3	108.7
SRAM II Development: $ Millions	134.0	197.0	217.0	212.8
Procurement: Quantity	-	-		25
$ Millions	-	-	10.8	83.2

(4) Conventional B-52s

In October 1988, for the first time since the Southeast Asian conflict, B-52 bombers were dedicated for use in a conventional-only role. Conventional B-52 forces significantly augment our range of options for providing air support for ground and naval operations worldwide. In FY 1990, there will be three B-52G squadrons dedicated to conventional missions. The aircraft are receiving a number of upgrades, including the Global Positioning System, which allows for greater accuracy in weapons delivery. They will be able to carry a variety of weapons, including gravity bombs, antishipping mines, Harpoon air-to-surface missiles, Tacit Rainbow missiles for defense suppression, and precision-guided Have Nap missiles.

b. Strategic Defensive Forces

(1) Strategic Defense Initiative (SDI)

The Strategic Defense Initiative, established in 1983, is the centerpiece of this administration's program for strategic defensive forces. It offers a fundamentally new approach to our strategic relationship with the Soviet Union and has demonstrated outstanding progress over the past six years in key technology areas. Chapter III.1 discusses in detail future plans for the program.

(2) Air Defense

The near-term modernization of our interceptor forces and surveillance systems will be completed by the early 1990s. All F-106 interceptors have now been retired and replaced by F-15s, F-16s, and F-4s. By 1992, we plan to replace all of the F-4 interceptors in the force with F-16s modified for the air defense mission.

To replace the obsolete Distant Early Warning Line, we are building a new radar network -- the North Warning System -- jointly with Canada. The 15 long-range radars in the system have now been activated, and we expect to bring 39 short-range radars on line by 1992 using funds requested in the FY 1990 budget. Once the system becomes fully operational, it will provide an unbroken, low- to high-altitude surveillance barrier along the Arctic coast of Alaska and Canada and the coast of Labrador.

The Over-the-Horizon-Backscatter (OTHB) radar system rounds out our air defense surveillance network, providing coverage over very large ocean areas to the east, west, and south of our borders. All three sectors of the east coast OTHB site have begun limited operations, and the radars have been tested against cruise-missile-size objects. Construction of the three west coast sectors of the network is under way, and work will begin on the first Alaskan sector this year. The FY 1990-91 budget seeks funds for the second Alaskan sector and for one of two sectors planned for deployment in the central United States. That sector, covering the Gulf of Mexico, will contribute greatly to our national efforts against drug smuggling.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
Strategic Defense Initiative Development: $ Millions	3,553.0	3,627.4	5,590.5	6,671.1
Air Defense Development: $ Millions	121.9	204.3	321.1	363.4
Space Control Development: $ Millions	125.4	18.0	126.4	161.1

Our longer-term goal -- defending against future low-observable cruise missiles and bombers -- cannot be achieved by upgrading current systems. It will require radically improved surveillance technologies, intercept missiles, antisubmarine warfare capabilities, and battle management techniques. The decision to pursue full-scale development of advanced air defenses under the Air Defense Initiative (ADI) program is linked to decisions concerning ballistic missile defenses. Regardless of future decisions on strategic defenses, however, it will be essential to preserve our warning capability as Soviet cruise missiles become more difficult to detect. Therefore, the ADI places highest priority on developing technologies that can improve surveillance performance against low-observable targets.

The large increase in the number of intercepts of Soviet bombers on training missions near our coasts over the past year offers clear evidence of the growing Soviet emphasis on bombers and cruise missiles. Further, new Soviet submarines, which are increasingly difficult to detect and track, could also be used to launch cruise missiles. Any reductions in the ballistic missile threat, whether through arms control or defenses, will increase the relative importance of the cruise missile threat. A comprehensive ADI effort could, however, discourage the Soviets from building an advanced cruise missile by making it clear to them that we would be technologically prepared to negate their investment with an effective air defense.

(3) Space Control

A U.S. antisatellite system is essential to deter the Soviet Union from using its antisatellite weapons and, should deterrence fail, to destroy Soviet satellites, especially those that directly threaten U.S. naval forces. Consequently, the FY 1990-91 budget proposes a joint-service program to develop a surface-launched, hit-to-kill ASAT system. Although the program incorporates competition among several alternative approaches, we expect the new ASAT program to capitalize upon technologies being developed for a mid-course interceptor for ballistic missile defense. Compared with the previously cancelled air-launched miniature vehicle ASAT system, the new ASAT system offers shorter response times and the ability to reach higher altitudes.

c. *Strategic Command, Control, and Communications*

We have made substantial progress over the past eight years in implementing the initiatives put forward by the President in 1981 for correcting deficiencies in the warning systems, command centers, and communications systems supporting the strategic forces. The following sections summarize our major accomplishments to date and describe our plans for FY 1990-94. Chapter III.G presents an overview of the entire C³I program.

(1) Missile Warning and Attack Assessment Sensors

The funds we are requesting in FY 1990-91 will complete nearly all of the planned improvements in the systems we deploy to warn of and assess ballistic missile attacks.

Satellite Early Warning System: Since 1981, we have been improving the satellites on which we rely to provide initial warning of a ballistic missile attack. The first operational satellite with improved performance and survivability features is scheduled for launch this year. By the end of FY 1994, a full constellation of the new satellites will be operational.

PAVE PAWS: With the deployment in FY 1987 of the final two radars in the PAVE PAWS network, we

obtained surveillance coverage of all submarine patrol areas off our coasts. Upgrades of the data processing capabilities of the two older radars in the system will be completed with funds requested in FY 1990-91.

Ballistic Missile Early Warning System (BMEWS): BMEWS radars located in Greenland, Great Britain, and Alaska would confirm satellite warning of an ICBM attack against the United States. Upgrades to the Greenland radar were completed in 1987, and similar improvements are being made at the installation in Great Britain. The modifications include a new phased-array radar that will permit the detection and tracking of a large number of targets with small radar cross sections. When completed in FY 1992, the upgrades will improve warning of missile attacks against Western Europe and of SLBM attacks on the United States.

Nuclear Detonation Detection System (NDS): NDS sensors, planned for installation on the satellites of the NAVSTAR Global Positioning System, will give us the ability to detect and pinpoint the location of nuclear detonations worldwide. Data from the sensors would be used to assess damage during and after a nuclear attack and to monitor compliance with the nuclear testing treaty in peacetime. The first operational satellite hosting NDS sensors will be launched in FY 1989, and the complete constellation is expected to be operational in FY 1992. The installation of NDS terminals at the National Military Command Center (NMCC), the Alternate NMCC, and the National Emergency Airborne Command Posts is scheduled to be completed in the mid-1990s.

(2) Command Centers

The strategic modernization program includes several initiatives to improve the survivability of the command centers serving our strategic nuclear forces. The FY 1990-91 budget completes essentially all of these initiatives for our fixed command centers and airborne command posts. In addition, the budget seeks funds to continue development of a new low-frequency transmitter for the airborne command posts. Scheduled for introduction in FY 1994, the system offers significant improvements in performance and reliability over the equipment currently in use in our command post aircraft.

(3) Communications

In the early 1980s, we recognized the need to improve the performance, survivability, and reliability of our strategic communications systems. Our modernization efforts in this area have centered on six programs: the Defense Satellite Communications System (DSCS), the Milstar satellite communications system, the Ground Wave Emergency Network (GWEN), Minia-

ture Receiver Terminals (MRTs), TACAMO E-6A aircraft, and the Extremely-Low-Frequency (ELF) submarine communication network. These systems, which link warning sensors to command centers and the command centers to our nuclear forces, are essential to deterrence. Most of the planned improvements of our strategic communications systems will be fielded by the early 1990s using previously authorized funds. The FY 1990-94 program allows us to complete development, and then to begin deploying during the mid-1990s, the remainder of the systems needed to complete our modernization program.

(a) Defense Satellite Communications System (DSCS)

New DSCS III satellites, which are replacing older DSCS II models, offer survivable, jam-resistant, high-data-rate communication links from our command centers to warning sensors and the nuclear forces. Three of a planned constellation of seven satellites are already on orbit. DSCS III receivers will be installed in ICBM launch control centers beginning in FY 1990 and will be fully operational in FY 1991.

(b) Military Strategic and Tactical Relay (Milstar)

The first Milstar satellite will be launched in the early 1990s, and an initial operational capability (three on-orbit satellites) will be achieved by the end of the FY 1990-94 program. The Milstar system, which uses extremely-high-frequency communications channels, will furnish global links that are much less susceptible to jamming and nuclear effects than is any other satellite communications system now in operation.

(c) Ground Wave Emergency Network (GWEN)

The GWEN system recently completed its initial operational tests and will go into service later this year. Operating in the low-frequency (LF) band, this 56-node network would ensure the transmission of tactical warning information in the event of a nuclear attack. It also provides the Strategic Air Command an assured means of directing the launch of aircraft on alert at its main operating bases. To reach SAC bases to which bombers might be dispersed, we will add 40 more nodes to the system with funds authorized in FY 1988. The full system is scheduled to be operational in FY 1993.

(d) Miniature Receiver Terminal (MRT)

MRTs, operating in the very-low-frequency/low-frequency (VLF/LF) band, will enable our strategic bombers to receive messages from airborne command posts at much longer ranges than are possible with ultra-high-frequency, line-of-sight communications. VLF/LF communications are also much less susceptible to nuclear effects and jamming than are high-frequency or ultra-high-frequency satellite communications. The MRTs will enter production this year and will be installed on nearly all the B-1 force by FY 1991. By the mid-1990s, we plan to equip our B-52H bombers with the system as well; procurement funding for those terminals is requested in the FY 1990-91 budget.

(e) TACAMO E-6A Aircraft

TACAMO aircraft, using very-low-frequency (VLF) radio communications, would relay retaliatory orders to deployed ballistic missile submarines in the event of a nuclear attack. The E-6, a modified Boeing 707, is faster and has greater range and endurance than the EC-130 that is now performing the TACAMO mission. We plan to buy the last seven of a planned fleet of sixteen E-6As with funds appropriated in early FY 1990. The E-6A squadron serving the Pacific submarine fleet will become operational in early FY 1990 and the squadron for the Atlantic in FY 1991. The FY 1990-94 program will equip the E-6A aircraft with Milstar satellite communications terminals and the same VLF transmitter being installed on the airborne command posts.

(f) Extremely-Low-Frequency (ELF) Communications

ELF transmitters, installed in the north-central United States, would transmit warning messages to deployed submarines in a nuclear attack. ELF communications can penetrate seawater to much greater depths than can higher-frequency communications, permitting submarines to receive messages without disclosing their location. The first of two transmitters planned for the system began operations in 1986, and the second will be activated this year. The entire SSBN force will be equipped with ELF receivers by FY 1992.

d. Nonstrategic Nuclear Forces

Our programs for the nonstrategic nuclear forces reflect the successful conclusion of the Intermediate-Range Nuclear Forces (INF) Treaty in late 1987, as well as our progress in implementing NATO's 1983 Montebello Decision to reduce the number of nuclear weapons in Europe while modernizing the remaining forces. As part of that effort, we are continuing to improve the survivability, effectiveness, safety, and security of our remaining warheads and delivery systems.

In following through on the Montebello Decision, we have decreased NATO's nuclear stockpile in Europe by about 25 percent, while maintaining the minimum number of warheads needed for a credible deterrent. Honest John and Nike Hercules missiles, along with atomic demolition munitions, have been withdrawn from the inventory. The number of artillery-fired atomic projectiles and tactical bombs has been reduced.

Since 1980, we have substantially enhanced the security of our nonstrategic nuclear weapons stockpile through the increased use of devices that are designed to preclude the weapons' unauthorized use. We are using insensitive high explosives in our new weapons to preclude their inadvertent detonation and any potential scattering of nuclear material as a result of an accident or as a consequence of enemy fire.

(1) INF Treaty

The successful conclusion of the INF Treaty, which for the first time will eliminate an entire class of nuclear missiles, is directly attributable to the strong support we received from our allies in implementing NATO's decision to develop and deploy the Pershing II missile and ground-launched cruise missiles (GLCMs). Within the next three years, the United States will destroy 846 missiles, each capable of delivering a single warhead, and the Soviet Union will destroy 1,846 missiles that could deliver 3,154 warheads.

Notwithstanding the INF Treaty's success in reducing the number of nuclear weapons arrayed against NATO, we must remember that deterrence in Europe depends on maintaining a nuclear force structure capable of providing a full set of flexible response options. The continuing unfavorable balance in conventional forces confirms the need for nuclear forces. To ensure a credible deterrent, we expect to place additional emphasis on dual-capable aircraft (i.e., aircraft assigned missions for delivering both nuclear and conventional weapons) as well as on sea-based systems to hold at risk targets located deep in the Warsaw Pact.

	FY 1988 Actual Funding	FY 1989 Planned Funding	FY 1990 Proposed Funding	FY 1991 Proposed Funding
Strategic Surveillance and Warning Development: $ Millions	126.8	145.1	164.7	91.5
Strategic Command Centers Development: $ Millions	98.8	53.6	63.5	46.9
Strategic Communications Development: $ Millions	678.8	833.4	769.7	663.7

(2) Short-Range Nuclear Forces

NATO's short-range battlefield nuclear forces deter Soviet aggression and inhibit the Warsaw Pact from massing its ground forces to break through NATO's conventional defenses. In the past eight years, we have developed and deployed a modern 8-inch artillery-fired atomic projectile (AFAP), which has longer range and greater accuracy than the older version, along with modern built-in safety and security features. In the early 1990s, we plan to field a new 155mm nuclear artillery round. A continuing congressional restriction on the number of new AFAPs that can be produced, however, restricts the full modernization of our nuclear artillery stockpile.

Begun in FY 1989, the Follow-On to Lance (FOTL) is a major new program designed to meet requirements predating the INF Treaty. FOTL will replace the aging Lance missile system with a modern longer-range system. Current plans call for the use of the Multiple-Launch Rocket System M-270-type launcher for the FOTL.

(3) Aircraft Systems

Since 1980, we have replaced our older F-4 dual-capable aircraft (DCA) with F-16s and F/A-18s. These forces will be augmented, beginning in the early 1990s, with new E-model F-15s. In the meantime, we are continuing to improve the survivability of our DCA and their nuclear weapons by constructing additional hardened aircraft shelters and weapon storage vaults and by providing the forces with defensive chemical warfare equipment. Through cooperative efforts with our allies, we are also improving air defenses at NATO airfields.

The FY 1990 budget provides initial funding for a new air-delivered weapon, the Tactical Air-to-Surface Missile (TASM), designed to meet requirements predating the INF Treaty. A standoff nuclear missile, the TASM will extend the effective range and improve the survivability of many NATO DCA. We plan to develop a modified SRAM-II missile to meet the TASM requirement. Final deployment decisions on the FOTL and TASM systems will be made in consultation with our NATO allies.

(4) Sea-Based Systems

Nuclear-capable carrier-based aircraft and the nuclear Tomahawk Land-Attack Missile (TLAM/N) contribute to our nuclear reserve force, provide a worldwide deterrence presence, and deter Soviet use of nuclear weapons against U.S. naval forces. By the mid-1990s, we will have distributed long-range firepower throughout the fleet with the deployment of several hundred TLAM/Ns.

With the exception of TLAM/N and the new strike bomb, the current U.S naval tactical stockpile is approaching the end of its useful life. We therefore are developing a new nuclear depth/strike bomb (NDSB) for introduction in the early 1990s. We also are considering acquiring a nuclear variant of the Sea Lance submarine-launched antisubmarine missile. If approved, that system could be ready for deployment in the mid-1990s.

3. Conclusion

The strategic modernization program has required both time and money to redress the strategic weaknesses confronting the administration in 1981. President Reagan's defense policies strengthened U.S. national security by providing flexible and modernized nuclear forces. These forces make the outcome of any attack against the United States so uncertain that the resultant conflict would be judged by any rational adversary as unwinnable. Our programs have helped us win unprecedented arms control concessions from the Soviets. Finally, our modernized forces have also lessened the risks to our security from Soviet technological breakthroughs or Soviet violations of arms control agreements.

Preserving these gains depends on the Congress's willingness to maintain its commitment to a strong nuclear deterrent.

G. COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

1. Introduction

Deterring and defeating aggression requires more than combat forces and a logistical support system. It also requires command, control, communications, and intelligence (C^3I) systems: the communications networks, warning systems, command facilities, and information systems necessary for military decision-making and force management.

In 1981, substantial weaknesses existed in our national security posture. Responding to this situation, we embarked on a comprehensive program to revitalize our defense capabilities. A cornerstone of the overall revitalization plan focused on rebuilding our C^3I systems. At that time, severe deficiencies existed that limited the ability of our civilian authorities and military commanders to command and control our military forces effectively. These included:

- The inability of our strategic C^3I systems to survive a nuclear attack;

- A general lack of interoperability among the communications systems of our ground, air, and naval forces;

- The vulnerability of our communications to jamming;

- Aging and fragile worldwide communications systems;

- Deficiencies in the ability to obtain and correlate information on enemy locations;

- And a shortage of security resources needed to prevent the compromise and exploitation of sensitive information.

In responding to these and other recognized deficiencies, we designed and initiated a number of programs directly aimed at resolving these weaknesses. The result has been tangible, across-the-board progress.

2. Command, Control, and Communications: Structure, Composition, and Programs

Our command, control, and communications (C^3) systems are structured to address force management requirements for a range of specific missions. These systems are designed to support the functions shown in Chart III.G.1.

a. Strategic C^3

Strategic C^3 systems consist of the attack warning and assessment systems, command centers, and communication systems needed for the positive command and control of our nuclear forces. To resolve critical deficiencies in our strategic C^3 systems and, in turn, to provide assured and enduring command and control of the strategic nuclear forces, we initiated a concentrated effort in 1981 to thoroughly modernize our strategic C^3 capabilities. These efforts are beginning to pay off as we develop and deploy new strategic C^3 systems and upgrade older strategic C^3 equipment.

For example, we are improving our ability to detect and assess an attack on the United States from either missiles or bombers by:

- Replacing the aging Distant Early Warning (DEW) line radars with the new North Warning System (NWS);

- Developing and deploying new Over-the-Horizon Backscatter (OTHB) radars to provide early detection of bombers and other air-breathing threats;

- Deploying and upgrading our PAVE PAWS radar systems to increase our ability to warn of a submarine-launched ballistic missile (SLBM) attack; and

- Upgrading our Ballistic Missile Early Warning System (BMEWS).

The capability, survivability, and endurance of our command centers have also been greatly improved. To provide better support for the National Command Authorities (NCA) and top military commanders, the National Military Command Center (NMCC) and its alternate have been upgraded by providing protection against electromagnetic pulse (EMP) effects; modernizing their power systems; and improving their ability to receive, process, and transmit information rapidly. The fixed and airborne command centers of many of our commanders in chief (CINCs) are being hardened against EMP effects and upgraded with improved communications systems. Automated data processing upgrades are also planned for the National Emergency Airborne Command Posts and the CINC airborne command posts.

Command, Control, and Communications (C³) Systems

Chart III.G.1

Strategic C³ Systems	Theater & Tactical C³ Systems	Defense-wide Communications & Information Systems
Attack Warning & Assessment	Command Centers & Facilities	Information Processing and Display
Command Centers & Facilities	Theater/Tactical Communications	Long Haul Communications
Communications Connectivity	Navigation & Position Fixing	Support & Base Communications
		Information Security

The strategic communications systems that link our warning sensors, command centers, and nuclear forces will improve substantially as we deploy the Ground Wave Emergency Network (GWEN), a dispersed network of radio relay stations and user terminals designed to ensure connectivity to the nuclear forces. Our strategic connectivity to deployed submarines will be improved as we field the E-6A replacement for the old EC-130 Take Charge and Move Out (TACAMO) aircraft. The long-range solution to our strategic communications requirements, however, rests with the Milstar satellite communications system. We are developing this system which, when completed, will provide global jam-resistant communications for both our strategic and tactical forces. Chart III.G.2 illustrates these major new strategic C³ systems, and Chapter III.F describes them in greater detail.

b. Theater and Tactical C³

Theater and tactical C³ systems are the command centers and facilities, communications, and information systems required by military commanders to exercise authority and direction over their forces. The objective behind our efforts to modernize these systems has been to provide the secure, interoperable, and enduring C³ systems needed for U.S. and allied forces to be effective in the projected threat environment.

To support our tactical ground forces, we have fielded systems for improving the effectiveness of these forces. For example, the Position, Location, and Reporting System (PLRS) is providing commanders with the secure means to identify and locate their forces on the battlefield. Fielding of the Army Tactical Command and Control System (ATCCS), a network of computer terminals for processing combat information, is also aiding the employment and control of these forces.

Tactical forces communication has also been improved by new TRI-TAC digital ground communications equipment, which replaces aging and less secure analog equipment. Our communications are also being improved with the Single Channel Ground and Airborne Radio System (SINCGARS), a new family of secure very-high-frequency (VHF) combat net radios, and with Mobile Subscriber Equipment (MSE), a fully secure voice, data, and facsimile communications system similar in function to civilian cellular telephones.

Significant progress has also been made in improving the C³ capabilities of service tactical air control systems with the joint procurement of the Air Force's Modular Control Equipment (MCE) and Marine Corps' Tactical Air Operations Modules (TAOMs). These ground-based air control systems will provide more effective control of fighter aircraft, process and

Major New Strategic C³ Systems

Chart III.G.2

share early warning surveillance data among joint/NATO force participants, and support air traffic control missions. Additionally, we have fielded the Joint Tactical Information Distribution System (JTIDS) Class 1 terminal and are developing the Class 2 terminal for fighter aircraft. When completed, the JTIDS will provide high capacity, secure, jam-resistant data transfer among a wide variety of tactical forces.

Significant improvements also have been achieved in battle management of war at sea by linking all naval combatants in a battle group/battle force with key shore commands using high data rate satellite information exchange systems to provide timely intelligence and targeting data to tactical commanders afloat.

c. *Defense-wide Communications and Information Systems*

Defense-wide communications and information systems support the management of nuclear and conventional forces. They provide information processing and display, global and base level communications, and information security.

Our major information upgrade efforts have focused on developing and fielding the Worldwide Military Command and Control Information System (WIS) and improving our attack warning and assessment capabilities. The WIS will replace obsolete automated data processing (ADP) systems with modern,

worldwide ADP capabilities to support the NCA, the Joint Chiefs of Staff, and the CINCs in force planning and employment. Actions are under way to procure new work stations, and local area networks are being tested at several WIS sites. The modernization of WIS sites will continue over the next few years as new work stations are fielded and additional capabilities, such as local area networks, are added.

We also have several programs to modernize or replace the ADP systems which support the NCA and CINCs in attack warning and assessment. Once completed, they will meet our tactical warning needs well into the next century. These programs will all be completed by the early 1990s.

The Defense Communications System (DCS) provides global common user long-distance, or long-haul, telecommunications service to the Department of Defense. DCS modernization initiatives have been aimed at integrating the Defense Data Network (DDN), Defense Switched Network (DSN), and other transmission/network related programs. The DDN is our primary means of providing secure, interoperable, and survivable long-haul data communications to DoD subscribers. The design and development phases of the DDN have been completed, and the thrust of the current program is on connecting the users to the network. The DSN program will replace the old Automatic Voice Network (AUTOVON) with a state-of-the-art long-distance telephone system for command and control and operational support of DoD. Portions of the system are in place, and we are continuing to install and test DSN equipment worldwide.

During this decade, our development of information systems security capabilities has been revolutionized. Through new joint government/commercial initiatives, we have drastically decreased the cost of providing and maintaining communications and computer security (COMSEC and COMPUSEC) devices. In the area of COMSEC, the STU-III secure telephone program has resulted in the mass production and fielding of a low-cost solution to this nation's number one secure voice communications vulnerability. In addition, advances in microchip technology have permitted the embedding of security capabilities into the circuit board design of our communications systems, resulting in major weight, power, maintenance, and cost savings.

In the COMPUSEC area, we established the Computer Security Center in the early 1980s to respond to the threat of computer attacks (e.g., "viruses", "hackers"). The Center's ongoing activities are projected to result in the commercial availability of approximately 90 approved COMPUSEC products by 1991. All of the above will provide the capabilities to ensure that information vital to our national security can be protected.

3. Intelligence: Activities and Programs

Our intelligence activities are designed to collect and process a wide range of information and to disseminate the results to national, departmental, and tactical users, permitting them to respond effectively to military, diplomatic, and economic developments. Within OSD, management of intelligence and related activities also includes oversight of electronic combat (EC) and special technology efforts. The full scope of our intelligence and special warfare functions is shown on Chart III.G.3.

Since effective force management depends on integrating C^3 and intelligence systems, an equal priority has been placed on modernizing our intelligence capabilities. Consequently, considerable gains in developing and deploying better intelligence systems have been realized. Although many of these accomplishments remain highly classified, much has also been achieved in unclassified areas.

a. National and Tactical Intelligence

Our intelligence activities are accounted for in two separate, but related programs: the National Foreign Intelligence Program (NFIP) and Tactical Intelligence and Related Activities (TIARA). Under presidential direction, the Director of Central Intelligence manages the overall NFIP with our assistance. TIARA programs are developed and managed by DoD to respond to operational commanders' need for time-sensitive intelligence. These tactical systems, whose primary mission is supporting the operating forces, also support the intelligence requirements of other sectors of the federal government.

We have greatly improved our intelligence capabilities by:

- Developing a variety of tactical intelligence systems to acquire and process real-time intelligence on enemy locations and movements.

- Continuing a number of programs designed to fuse and disseminate battlefield intelligence rapidly. The purpose of these manifold initiatives is to unite the existing separate intelligence collection, processing, and dissemination systems into a simplified structure within and across mission areas. The result will be a greatly enhanced capability to locate and strike quickly enemy positions in combat.

Intelligence and Special Warfare Activities

Chart III.G.3

National Intelligence	Tactical Intelligence	Intelligence Training
National Foreign Intelligence Program Intelligence Technology Indications and Warning	Tactical Intelligence Systems & Related Technology Surveillance & Reconnaissance Tactical Warning Target Acquisition Mapping, Charting & Geodesy	Intelligence Career Development Defense Foreign Language Program Technical Training

Electronic Combat	Special Technology Support
Electronic Countermeasures Self-Protection C^3 Countermeasures	Special Operations Technology and Acquisition Counterinsurgency Intelligence Support

- Replacing the Defense Mapping Agency's (DMA) primary production process with a state-of-the-art digital mapping, charting, and geodesy (MC&G) production system. Installation, checkout, and testing of the new system will begin at the first production site. When complete, it will provide operational commanders with MC&G products and services utilizing digital source acquisition systems.

- Revitalizing our human intelligence by tightening its governing directives to preclude abuses, introducing new technology, and expanding the training program.

- Enhancing the quality of language training and status of linguists within DoD. The Defense Language Institute has increased its number of graduates, expanded and modernized its facilities, and introduced many innovative instructional techniques.

- Expanding the intelligence training facilities of the services, modernizing training tools, and introducing more realistic performance-oriented evaluation standards. This has resulted in better training and enabled new technology to be absorbed more quickly by the operating forces.

b. Electronic Combat

The purpose of electronic combat (EC) systems is to increase the survivability of our war fighting resources. To accomplish this efficiently and economically, we have developed a master plan that serves as a roadmap for the individual Service's acquisition programs. Commonality is an important objective of the plan.

Whenever practical, we have fostered joint programs among the Services. For example, we have established joint programs for the development of a new countermeasures dispenser and an expendable decoy for tactical aircraft. Additional EC programs are discussed in Chapter III.C.

c. Special Technology Support

The unique needs of Special Operations Forces (SOF) demand that new and specialized equipment be developed and acquired. In this area, we have emphasized the incorporation of new technology to support special operations and promoted improved intelligence support for special operations and low-intensity conflict. We have improved our SOF capabilities by procuring additional Combat Talon II infiltration/exfiltration aircraft and by providing additional air refuelable helicopters which possess ad-

verse weather, night, and terrain-following capabilities. We have also developed and tested new SOF equipment, such as lightweight radios and special avionics. Future efforts will investigate new technologies for countering terrorism and reducing the weight and volume of SOF equipment.

d. Intelligence Oversight

The Assistant to the Secretary of Defense (Intelligence Oversight) (ATSD(IO)) is responsible for the independent oversight of all DoD intelligence and counterintelligence activities to assure that these activities are legal and proper. He conducts worldwide inspections of DoD intelligence elements and monitors the inspection programs of the Inspectors General (IGs) of the military departments, the National Security Agency (NSA), and the Defense Intelligence Agency (DIA). When appropriate, the ATSD (IO) conducts inquiries into intelligence activities that raise questions of legality or propriety. He reviews investigations conducted by DoD components to ensure that they are rigorously and thoroughly accomplished and that cor-

rective measures are taken. The ATSD (IO) reports directly to the Secretary of Defense and, as the DoD point of contact for the President's Intelligence Oversight Board (PIOB), submits a quarterly report to the Board.

4. Conclusion

We have accomplished much over the past few years in rebuilding our C^3I systems and, in turn, eliminating severe deficiencies in our C^3I capabilities. Having invested large amounts of time and resources in planning, designing, and developing these systems, we are now producing and deploying them. Now that we are in the final and most critical stages of the C^3I modernization effort, it is essential that we complete what has been started. The key ingredient in completing the effort is continuity of commitment and investment. Failure to see the modernization effort through, or a loss of funding, could erode the gains of the past and jeopardize our ability to maintain a strong defense posture.

H. RESEARCH AND DEVELOPMENT

1. Introduction

Research and development is our investment in the future. In the context of the current fiscally constrained environment it is difficult to appreciate the critical importance of spending money today for systems that will not become operational until many years into the future. Tomorrow's capability, however, will be secure only if we make the necessary investment today.

This administration has made much progress in the restoration of a healthy defense R&D program. Research development test and evaluation (RDT&E) budgets, as a percent of DoD Total Obligational Authority, have risen from the single digits of the 1970s to more than 11 percent for FY 1990. This extra investment has enabled us to develop weapon systems incorporating advances in electronics, propulsion, materials science, sensors, stealth, and other technologies discussed in this Report.

2. Issues for the Early 1990s

The main issue confronting us in the next several budget years will be how to make U.S. and allied science and technology as productive as possible, given the limited resources available. To do this, specialization in researching various technologies will be critical, but this must be accompanied by cooperation with our allies. In addition, virtually every decision in the research process must be considered within the context of quality versus quantity.

The quality versus quantity debate must be given the most serious consideration for at least two reasons. First, in many areas where we compete with the Soviets, our qualitative edge has been reduced. This loss becomes especially critical when we fail to compensate through increased quantity. Second, an improper emphasis on quality can lead to excessive, unproductive technical complexity resulting in a system that demands an unacceptable level of human competence to operate it.

In the coming decade as we and our allies strive to confront these and other issues, we will need to emphasize the maintenance of a strong and healthy technology base. In the United States, this means conducting effective Service-managed science and technology (S&T) programs with industry, laboratories, and universities. It also means supporting innovative programs at the Defense Advanced Research Projects Agency (DARPA) and the Defense Nuclear Agency (DNA). Finally, it means thorough testing and evalu-

ation of new systems. Of growing interest in all these programs will be efforts to improve our software technology base.

a. Science and Technology Program

A strong national security posture emanates from such factors as national resolve, industrial capability, morale, leadership, and training. In addition, there is a pervasive need for superior equipment that enables victory in combat. This capability will be possible only if advanced technical options are available that can provide the basis for developing the equipment superiority required. It is the task of the S&T program to provide these critical technical options. Significant components of our S&T program include the following:

(1) Chemical Warfare/Chemical and Biological Defense

Chemical and biological warfare threats to U.S. forces have increased significantly during the 1980s, as discussed in Chapters I.B and I.C. Improvements in collective and personal protective equipment, new decontamination and detection devices, and advanced medical protection and care have been provided to support our forces, should they have to operate in a chemical or biological warfare environment. In addition, advanced biotechnology techniques have provided technological breakthroughs for medical prevention and treatment and for biosensor devices.

(2) Superconductivity

Recently, materials have been discovered that exhibit superconductivity, or the vanishing of electrical resistance, at temperatures that could allow its practical use. This remarkable property offers prospects for improved sensors, faster computers, and much more compact and efficient electric and magnetic power systems. The complexities of the new materials are such that realization of their potential will require intensive development over a period of years. Meanwhile, prototype devices and systems are under development using lower temperature superconducting technology. This technology is not only useful in its own right, but also serves to shape the direction of the high-temperature materials program. It also allows invention and architecture to proceed at the same time the technology for the newer high-temperature materials is still being addressed.

(3) Balanced Technology Initiative (BTI)

The BTI is structured to advance technology considered important to the success of conventional defense missions. BTI smart weapons technology is accelerating the development of next generation fire-and-forget weapons that offer significant force-multiplier advantages for both short- and longer-range engagements. Technology involving the collection and exploitation of tactical intelligence will enable more effective use of our combat forces by improving targeting capabilities and facilitating more efficient use of battlefield assets. Armor/antiarmor research includes developments in advanced guns and projectiles and new weapons concepts, all intended to promote increased survivability and overall fighting effectiveness of ground combat forces. Other BTI efforts include high-power microwaves, enhanced blast munitions, and advanced close air support. Overall, BTI expedites the initiation of promising new research and accelerates the transition from technology to full-scale development.

(4) Aircraft Propulsion

The Integrated High Performance Turbine Engine Technology (IHPTET) program was initiated in FY 1988 as a coordinated industry-DoD-NASA effort with the goal of doubling aircraft propulsion system capability by the turn of the century. The program has proceeded smoothly, and industry participation has been high. In FY 1988, industry devoted a slightly greater amount than the government in cooperative support of IHPTET. Results of the initial evaluation of the first phase of the program involving jet engine technology were excellent, and a tri-Service effort on this phase will be initiated in FY 1989. The IHPTET program is a major effort contributing to our international competitiveness.

b. Industries, Laboratories, and Universities

Research conducted throughout the civilian as well as defense sectors is critical to our S&T advancement. These efforts include the following:

(1) Industry

A significant advantage the United States enjoys over potential adversaries is the existence of a broad, high quality, and innovative private industrial sector which also is the principal contributor to the DoD S&T program. Several industrial base initiatives complement our technology programs by ensuring an efficient and effective transition from a new idea to a military product. In addition, our major allies have strong and innovative technology bases that further enhance our national security posture.

(2) Defense Laboratories and Technology Transfer

Defense laboratories continue to fulfill a major role in developing technology to support military missions. At the same time, many of their advances offer significant opportunities for applications in commercial and humanitarian arenas. For example, our laboratories made vital contributions to the development of the satellite navigation system, which today provides navigational accuracy and safety for air, sea, and ground travel, both to military and commercial users. The biological and medical laboratories have spawned a plethora of advances in areas such as vaccines, artificial blood, and trauma treatment, all of which are finding humanitarian applications. In addition, research on methods to reduce the harmful effects of radiation is finding application in treatments for cancer and AIDS. The laboratories also traditionally have maintained close interaction with industry, thereby contributing to a steady transfer of military technology for other purposes.

(3) University Research

University research continues to be a source of new science and engineering knowledge essential to future military capabilities. Also, our university research program promotes military and national competitiveness by training future scientists and engineers to sustain the defense technology base. DoD research programs support more than 7,500 graduate students in science and engineering through research assistantships, fellowships, and traineeships. In addition, we will continue the University Research Initiative (URI). This program provides an interdisciplinary approach to research that can accelerate progress in areas that are ripe for team efforts. It can also speed transition of research results to practical applications in defense systems.

c. Defense Nuclear Agency (DNA)

DNA is responsible for DoD's research and experimental efforts to ensure survivability of military forces in a nuclear environment and their effectiveness against an increasingly hardened threat. DNA seeks to identify and correct vulnerabilities in existing nuclear weapon systems and to ensure the survivability and effectiveness of future systems. DNA carries out its responsibilities by developing and advancing nuclear weapons effects technology; modeling nuclear environments, interactions, and results; and conducting experiments and tests.

When possible, as in testing components and subsystems, nonnuclear simulation and high-explosive tests are employed to evaluate the effects of radiation, blast, and shock. DNA is pursuing development of nonnuclear simulators that are required for testing large systems that cannot be handled in the limited space available in underground nuclear tests.

An area of growing importance in DNA is arms control. DNA has been involved in some arms control activities for years and during the past year has been assigned the responsibility for the Department's research and development on arms control problems. DNA's scope of effort will range from technology development on verification to assisting the Department's staff in assessing the effects of arms control alternatives being explored.

d. The Defense Advanced Research Projects Agency (DARPA)

DARPA is our corporate research organization, chartered with pursuing imaginative and innovative ideas leading to systems with significant military utility. DARPA's programs focus on technology development, proof-of-concept demonstrations of revolutionary approaches, and prototyping. DARPA will invest in high-risk technology when, upon maturity, it promises to provide a major advance in our military capability. Several representative DARPA programs are discussed below.

(1) Manufacturing Technology

Our manufacturing program is aimed at developing the technology base for high-performance defense manufacturing that will sustain its advantage over foreign competition. Initial emphasis is focused on advanced industrial sectors vital to defense, such as microelectronics, composites, navigation and guidance for aerospace, optics, ceramics, and superconductors. Current efforts include semiconductor manufacturing technology (SEMATECH) and X-ray lithography. Superiority of our defense systems is directly dependent upon a strong microelectronics industry, whose products are a force multiplier. Not only do they enhance the performance of modern weapons, but they also enable the sophistication required in command and control systems and intelligence.

(2) Advanced Space Technology Program (ASTP)

Our Advanced Space Technology Program is designed to examine a broad range of emerging technologies that could enhance an assured mission capability for the future. The DARPA technology investigations offer significant potential for reducing the size, weight, and cost of both current or future multipurpose satellites and small lightweight satellites and payload systems. Likewise, related research and testing could lead to a new class of small launch vehicles to meet the needs of the Services and further enhance assured mission capabilities.

(3) Prototyping

Prototype efforts at DARPA will take system development a step beyond demonstrating technical feasibility of a system concept by emphasizing operational and manufacturing issues. These efforts, however, will stop considerably short of a production prototype. In addition to demonstrating system performance, DARPA prototypes will be tested in the field environment with the participation of the Services. DARPA prototypes can be systems or subsystems that incorporate technology designed to increase performance, provide an innovative solution to an important need, or provide a completely new military capability.

Since the purpose of DARPA prototyping is to accelerate the introduction of advanced technology into the field, prototype programs are strongly influenced by the CINCs and Service staffs. The character of this involvement varies depending on the specific program but can run from providing expert operational advice to participating in the management and funding of the effort. For cases where Service funding is provided, the principal DARPA contribution typically comes in the early years with the principal Service contribution coming in the out years.

e. Transferring R&D to Deployed Systems

Another critical challenge confronting the United States and its allies is how to effectively transfer the technology we develop to deployed systems. Very little, if any, military benefit can be derived from technology achievements that remain in the laboratory. Therefore, reducing the lead time for incorporating new technology into our military weapon systems is one of our principal goals to improve the acquisition process. Numerous factors, however, make this difficult. For example, there is often no correlation between the pace of technology development and windows of opportunity for insertion. In addition, demonstrated technology is not always readily producible, and current or projected warfighting doctrine does not always include integration of new concepts into the force structure. Technology transfer, therefore, is a management concern requiring close interaction between the require-

ments and development communities and the users in order to be successful.

f. Software Technology

Our superiority in computer technology undergirds our ability to produce systems which are more capable, reliable, and flexible than those of potential adversaries. Our DoD software technology programs must keep pace with computer hardware technologies to maintain our edge in the quality versus quantity debate.

g. Test and Evaluation

Substantial strides have been made in the test and evaluation (T&E) of our nation's weapon systems and in our capabilities to perform tests. Payoffs are being realized by more thorough testing, testing earlier in the procurement cycle, and increased attention to realistic operational testing. The Director, Operational Test and Evaluation (DOT&E) has made inroads into early operational testing to uncover faults and recommend appropriate action before there have been large investments of time and dollars. Recent accomplishments in our test and evaluation program include the following:

- The Department has had oversight of more than 163 active acquisition programs, to include approval of T&E master plans, operational test plans, and on-site observation of T&E activities.

- Increased management attention on the Major Range and Test Facility Base has concentrated on assessing the status of all the facilities and building a coordinated OSD investment plan for FY 1990 funding.

- In FY 1988, we fully established the Live Fire Testing (LFT) office and provided to the Congress the first assessments of the vulnerability and lethality of selected systems.

- Two major T&E programs -- the Foreign Weapons Evaluation (FWE) program, and the more recent Nunn Amendment-initiated NATO Comparative Test (NCT) program -- funded the testing of almost 200 friendly allies' systems.

- Joint Test and Evaluation (JT&E) programs have continued to examine the capability of developmental and deployed systems to perform their intended missions in a joint environment.

- Since 1981, DoD has made significant progress in improving both the quality and realism of portraying the threat for testing and training.

For the future, T&E will emphasize producing assessments to support milestone decisions and conducting realistic testing to support the acquisition decision process.

In the next few years, we must address several specific and significant issues. These include new initiatives in weapon systems assessments; major investments in test facilities and range resources (with special emphasis on improved operational and space-based test capabilities); placing further emphasis on realistic, high-threat, cost-effective simulations; and institutionalizing the Live Fire Testing program.

3. Conclusion

Our investment in R&D has contributed significantly to deterrence over the last eight years. We currently enjoy a lead over the Soviets in technologies of military significance. Our task is to maintain that advantage through innovative R&D programs in an across-the-board effort to translate our technological know-how into a maximum defense advantage. The management required must come largely from within the Department, but only through congressional cooperation can our goals be attained and our future defense secured.

I. THE STRATEGIC DEFENSE INITIATIVE

1. Introduction

Six years ago this March, President Reagan announced the creation of a research program that would become the Strategic Defense Initiative (SDI). In doing so, he offered the American people and our allies the hope of moving away from a deterrent strategy based solely on offensive retaliation toward one based increasingly on defense. The program's goal is to conduct research that can provide the basis for an informed decision regarding the development and deployment of a ballistic missile defense system. Such a system would protect citizens of the United States and allied nations from ballistic missile attack by convincing hostile nations that such an attack could never succeed. If deterrence should fail, the system would also provide a measure of protection against attacking ballistic missile warheads. It was believed then, and is believed today, that a transition to a defense-dominated deterrence would provide a safer and more stable way to keep the peace than the threat of retaliatory attacks on our adversaries.

SDI has made tremendous strides since President Reagan's 1983 speech, particularly in the program's organizational maturity and the number of technology options potentially available for a strategic defense system (SDS). Over the last five years we have made substantial technical progress and have prevented the Soviet Union from accruing a major ballistic missile defense technology advantage. The SDI program seeks to preserve both near- and long-term defense options. For example, kinetic energy systems (e.g., rocket interceptors) -- for use in the initial phase of SDS -- and directed energy weapons (lasers, particle beam) are being researched with equal dedication. These options are integral to the program's success in combatting the Soviet offensive and defensive program that includes countermeasures against strategic defenses.

In 1987, the Secretary of Defense approved the recommendation of the Defense Acquisition Board that six SDI elements (see the FY 1989 Annual Report) be advanced to the demonstration and validation phase. This meant that the technologies used in these elements were ready to move beyond concept exploration to the next phase. Prior to development and deployment, any strategic defense system must demonstrate an ability to meet the operational requirements established by the President: military usefulness, survivability, and cost-effectiveness. The purpose of the research into SDS/Phase I elements (see Chart III.1.1) is to determine whether Phase I technologies meet these strict requirements and are therefore feasible.

Affordability is a key issue that also must be addressed. Cost, therefore, has long been recognized as an important component of the SDI program, and cost-reduction efforts are being pursued in tandem with technology research. By anticipating potential SDI costs, and implementing technology development strategies that focus on reducing costs, we believe the SDS will be affordable.

2. SDI Program Components

SDI program accomplishments have increased our confidence that strategic defenses will prove feasible. The SDI Organization has conducted a series of kinetic energy and directed-energy weapons technology tests, such as HOE, the Delta 180 test, and the FLAGE series, that all successfully demonstrated the technological possibility of nonnuclear destruction of enemy ballistic missiles before they reach their targets. Conducting research on both near- and long-term technologies is a key requirement for the SDI program. With directed-energy experiments, researchers have demonstrated several key principles related to the operation of a large free electron laser, a weapon which could become powerful enough to destroy enemy ballistic missiles in the boost and post-boost phases of flight. Similar experiments are also being conducted using other types of lasers and particle beams. Although lasers and particle beams will not be available as soon as some of the kinetic energy systems, their importance to the overall SDI mission cannot be overstated. These technologies are necessary to thwart the potential effectiveness of Soviet countermeasures against one particular intercept method and to ensure a viable, robust future capability.

The pace of technology development over the past five years of directed-energy weapons has been tremendous. Although they build on the capability of a Phase I system, such systems would have at least one new mission: to thwart the effectiveness of a new generation of Soviet ICBMs and other possible counters to an SDS. Kinetic energy systems, lasers, and neutral particle beams would form a mutually reinforcing "triad" for defense systems much like complementary aspects of the Triad for offensive systems. Continued research in directed-energy weapons will allow us to maintain programmatic flexibility, to take advantage of maturing technologies, and to expand capabilities against an evolving threat.

Some surveillance and sensor technologies supported by the SDI program address other military (as well as SDI) needs. The capabilities of today's early warning radars and satellites could be greatly improved

SDS Phase I Architecture

Chart III.I.1
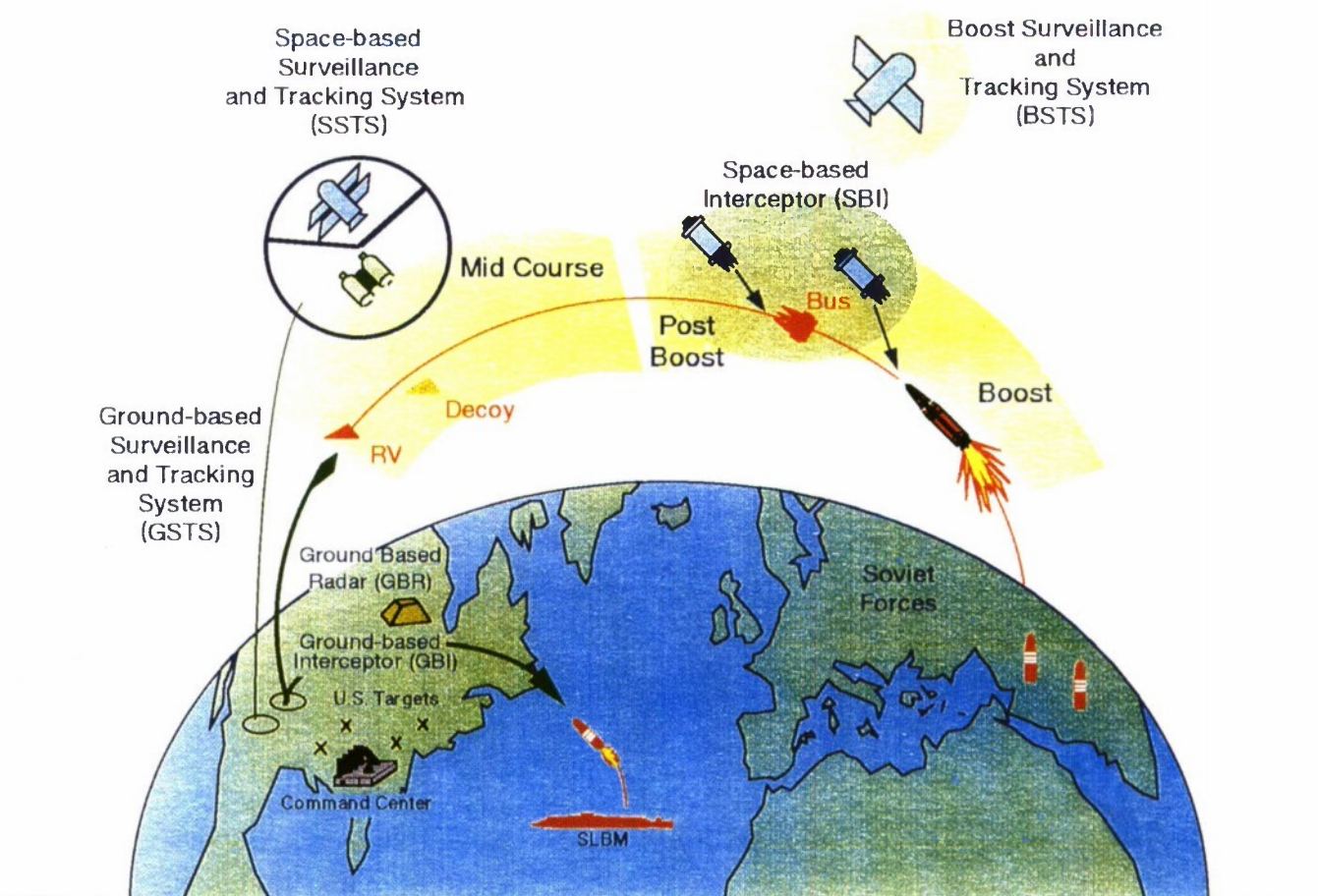
through advancements in detection capabilities. These new sensors will provide more accurate and reliable surveillance data of objects in space. Last year's DELTA 181 experiment demonstrated substantial improvements in our ability to find effective ways to discriminate between reentry vehicles and decoys. The continuation of sensor technology research and development is integral to the SDI program and our other security needs.

Let us not, however, underestimate the magnitude of the challenge. As the President stated, a defense against ballistic missiles is, indeed, a formidable technical undertaking. Nonetheless, the research supported by the Strategic Defense Initiative has progressed more rapidly than many expected. The United States is well on the way to attaining the necessary information to make an informed decision concerning the deployment of an SDS.

3. Theater Missile Defense Programs

Active defense (destruction of missiles in flight) has been identified as one counter to the threat of missile attack from the Warsaw Pact and the Third World, and development of active defense technology is part of the SDI mandate. SDI technology will be incorporated into systems capable of providing this protection. The first step in this process has been conducted with the cooperation of allies and includes characterizing the threat and developing candidate defense designs or architectures.

The result of these analyses has been the definition of hardware experiments that will evaluate active defense proposals and provide the United States and our allies with the information needed to make development and deployment decisions. Notable among these experiments is the cooperatively funded Arrow flight

experiments project involving DoD and the Israeli government. Other experiments include work with Great Britain on warhead lethality and battlefield sensor technologies. We are also pursuing experiments unilaterally that will provide a balanced appraisal of various theater missile defense technologies.

One element of the theater defense program that will provide long-term benefits is the Extended Air Defense Test Bed (EADTB). This will eventually provide the capability to evaluate defense designs, the effect changes in technology will have on those designs, and the influence of doctrinal or policy issues. This program, which will begin with a cooperatively funded effort between DoD and the Great Britain, has attracted great interest among our allies. A separate program, cooperatively funded with Israel, will develop a similar evaluation tool for the Middle East. Future programs will lead to more test facilities and the linking of theater test centers to the SDIO National Test Facility to evaluate more fully the relationship between theater missile defense and strategic defenses.

4. Conclusion

Since its inception, the SDI program has been the subject of intense debate; but tangible, impressive results over the past five years have given us increased confidence that strategic defenses are feasible. Furthermore, we have seen the return of the Soviet negotiating team to the Geneva arms talks, and several summits between President Reagan and Chairman Gorbachev. The SDI program, in part, helped facilitate these diplomatic advances. We cannot afford to ignore the results of our research in strategic defense, nor can we afford to waver in support for SDI.

When the Reagan Administration took office, the strategic environment was rapidly deteriorating. For many years the Soviet Union had been investing vast resources in its strategic offensive force buildup, while vigorously continuing to research and develop strategic defense technologies. Our efforts during the past five years have helped the United States address this situation by counterbalancing the Soviet defense technology program.

Thus, as the next administration takes office, our newly elected leaders will have more -- and better -- options available to them to ensure our national security than we had eight years ago. Our goal is to present a future administration with the option of moving from a deterrent relationship with the Soviet Union based on the threat of nuclear retaliation, to one that is increasingly based on effective defense against ballistic missile attack. This is an important option that will be considered carefully and in close consultation with both the Congress and our allies. All of the technical promise, however, may never be realized if the program does not receive adequate funding. Without full funding, the technology may fail to reach maturity in an appropriate timeframe to meet projected threats, program management options will be foreclosed, and we will be prohibited from pursuing a number of promising, innovative projects.

An important goal for any administration is to improve the world for those who follow and to provide successor administrations with better choices for securing a more peaceful and stable world. The SDI program represents a promising opportunity which this administration proudly passes on to those who follow. For the new administration, an opportunity exists to establish a safer defensive posture founded upon strategic defenses.

J. MILITARY SPACE PROGRAMS

1. Introduction

Contrary to frequent assertions, the "militarization" of space actually began with the development of the first long-range ballistic missiles in the early 1950s. However, the key milestone in the use of space for military and national security purposes occurred on October 4, 1957 when the Soviet Union orbited "Sputnik," the world's first man-made satellite. Sputnik was soon followed by other satellites, launched by both the United States and the Soviet Union. Many performed defense or defense-related functions, such as surveillance, attack warning, communications, and environmental observation.

During the last thirty years our reliance on space operations to support basic defense requirements has steadily increased. The loss of the Space Shuttle for over two and one-half years, combined with the failure of several other launch vehicles in one nine-month period, dramatized our dependence on space and also highlighted some current deficiencies in our launch capabilities. Moreover, the next ten years will see an even more dramatic increase in the importance of space for our national security. This will be especially true if we exploit emerging technologies to enhance significantly the effectiveness of our forces, while making more efficient use of our resources.

a. General Policy Elements

U.S. space activities are conducted by separate and distinct sectors: military, civilian government, and the nongovernmental commercial sector. It is in our national interest that these sectors mutually reinforce one another. Consequently, in January 1988, President Reagan signed a new National Space Policy directive designed to achieve better coordination, cooperation, and technology and information exchange among these sectors.

A major portion of the new national space policy is drawn from the current DoD space policy directive signed in February 1987. This directive views space as a medium -- like the land, the seas, and the atmosphere -- within which military operations may be required. In general, our efforts in space are designed to:

- Enhance deterrence, or if necessary, defend against enemy attack;

- Assure that hostile forces cannot prevent our use of space; and

- Enhance operations of U.S. and allied forces.

These goals will be achieved by providing secure, assured means for collecting and transmitting information, and by providing the means to counter aggression through space-related and strategic defense operational capabilities. This could include the potential use of manned space operations, or the "military man-in-space."

Advanced technology is one of our strong suits and is key to a cost-effective space capability. We are committed to enhancing our technology base and encouraging technological innovation to advance military space capabilities and to reduce costs. Further, we are making every effort to streamline design and acquisition and to simplify space operations to provide timely support to users while reducing acquisition and life-cycle costs.

b. Organizational Initiatives

Our principal focus concerns the implications of space operations for military doctrine and strategy, and our current and planned programs' ability to satisfy operational requirements. To this end we established, during the past year, the Defense Space Council (DSC) to advise me and the Deputy Secretary of Defense on space policy, and to provide oversight, coordination, and recommendations on space matters to DoD and NASA. The Under Secretaries of Defense for Policy and for Acquisition will serve as DSC co-chairmen. Other members include the Service Secretaries, the Vice Chairman of the Joint Chiefs of Staff, the Assistant Secretary of Defense for Command, Control, Communications and Intelligence, and the Director of the Strategic Defense Initiative Organization. Other senior Department officials will participate in DSC deliberations as matters warrant. The Defense Space Council's creation followed the formation, in 1985, of the United States Space Command (USSPACECOM), which consolidated responsibility for military space operations.

c. Summary of Progress Since 1981

Since 1981, we have twice modified and updated our space policy to reflect changes in the threat, available technology, and our estimates of the role of space over the longer term. Furthermore, we have improved cooperation and coordination between DoD and NASA to make more efficient use of our space resources. We are engaged with NASA in research and development of two major programs -- the Advanced Launch System (ALS) and the National Aerospace Plane (NASP) -- and we expect to work closely with

them on the space station program. Furthermore, we share an increasing number of R&D facilities with NASA. Finally, we have initiated new programs to overcome deficiencies in U.S. space capabilities and to meet the increasing Soviet space threat. A number of these are discussed below.

2. Space Support for Terrestrial Forces and Force Enhancement

Space systems can greatly enhance our terrestrial forces' combat effectiveness by providing communications, navigation, and real-time surveillance, tracking, and assessment support. These force enhancement capabilities (or "force multipliers") will provide effective operational support to military forces in peacetime, crisis, and in conflict.

There is, unfortunately, a popular misconception that associates military space capability with nuclear war scenarios. In a theater conventional conflict, however, military space systems are also of great importance. This is especially the case in theaters such as the Persian Gulf, or Europe, where we must project our forces over great distances. In these situations advanced technologies can increase our conventional forces' combat effectiveness by enhancing the accuracy of long-range precision munitions and by providing precise target acquisition and real-time surveillance information.

3. FY 1990-94 Programs

There are a number of improvements that we must make to our space infrastructure to attain our policy goals. I strongly urge the Congress to support these efforts.

a. Launch Capabilities

Revisions in DoD and national space policies emphasize the importance of assured access to space and the commitment to unmanned launch systems for payloads that do not require manned interface. Congressional support for this commitment has resulted in substantial improvements in our space infrastructure. The recovery from the Challenger and Titan accidents is well underway, with successful launches of all classes of operational DoD boosters (Titan 34, Atlas E, the new Titan II), and the successful launch of the Shuttle Discovery. Progress continues on new launch vehicles, including the Titan IV, Delta II, and Atlas II. The Titan IV and Delta II are scheduled for their initial launch in FY 1989.

While these launch vehicles will meet many of our national security needs until the late 1990s, they do not provide the low-cost, operationally responsive launch capability that will be needed in the next century. The ALS is a joint DoD/NASA program designed to provide the new family of vehicles to meet future national launch needs. Specific design requirements and acquisition schedules for the ALS vehicles will depend on payload requirements. The National Aerospace Plane (NASP) program, discussed below, may lead to a highly flexible, survivable, space launch vehicle in the longer term. Current and projected U.S. launch vehicles are illustrated on Chart III.J.1.

b. Satellite Systems

The requirements for flexible, multipurpose, and survivable satellite systems will increase over the next five to ten years. Arms control verification, strategic surveillance, space surveillance, and attack warning missions will all require increasingly sophisticated and survivable systems. Jam-resistant, survivable C^3 systems such as Milstar must be deployed. Most importantly, our space systems must be integrated for maximum effective use by the NCA and the combat commands.

There will also be increasing requirements for satellite support to the tactical field commander. We have already seen how new technology permits direct transmission of information from satellites to compact, mobile terminals for data processing and display. This would allow a ship's captain, an aircrew, or a soldier in the field equipped with such a terminal to have near-real-time access to space systems for gathering and communicating navigation, environmental, and other tactical information. Such information in the heat of battle would aid the commander in seeing above and through the "fog of war," and provide great advantages to our combat forces.

c. Antisatellite (ASAT) Capability

As the President, the Chairman of the Joint Chiefs of Staff, and I have stated repeatedly, the development and deployment of a comprehensive ASAT capability is an absolute necessity to prevent the Soviets from using hostile space systems to the detriment of our forces. The Intelligence Community has repeatedly informed the DoD and the Congress of the present and projected Soviet threat in this area. We ignore it at our peril, and we are inviting potential tragedy if this threat is not countered. The existence of a comprehensive U.S. ASAT capability will serve as a powerful deterrent to the Soviet use of ASATs against us.

U.S. Space Launch Vehicles

Chart III.J.1

Operational | In Production | In R&D

| SCOUT | DELTA | ATLAS[a] | TITAN 34D[a] | SPACE SHUTTLE | TITAN II[a] | TITAN IV[a] | DELTA II | ALS[c] | NASP[c] |

Payload to 185 KM (KG)[b]

| 260 | 3,500 | 6,100 | 15,000 | 26,000 | 2,400 | 17,800 | 5,200 | VARIABLE |
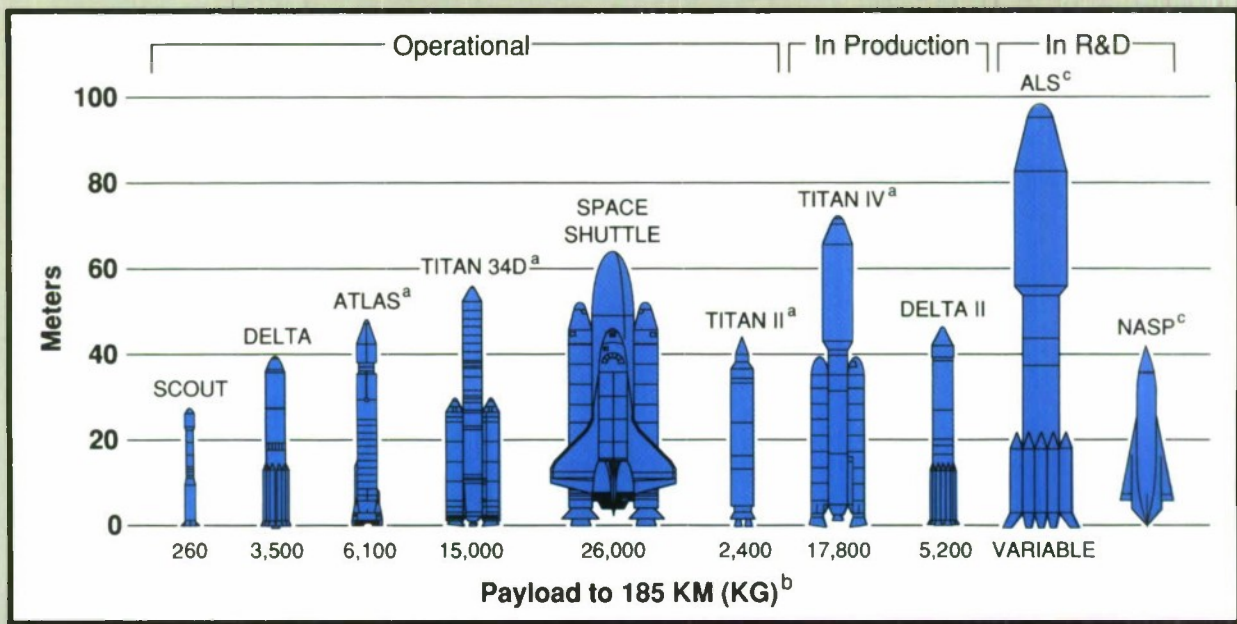
[a] Ballistic Missile Derived.   [b] Approximate.   [c] Height Approximate.

d. Assured Mission Capability

Our increasing reliance on space systems, however, raises the possibility of commensurate vulnerabilities. The greater our reliance on space systems to buttress deterrence, or enhance our capability to fight and win if deterrence fails, the more attractive a target they become for our adversaries. Unless we can protect these essential systems and ensure their survivability, our deterrent posture could be seriously degraded.

Such protection must come through programs to enhance our ground-based space surveillance network; through space-based sensors capable of real-time monitoring of all potentially threatening objects in space; and through increasing the survivability of satellites themselves. Satellite survivability may be achieved through active and passive means, as well as through the proliferation of satellite systems and on-orbit inactive spares that could be activated as replacements. Finally, we must continue to make assured mission capability a major factor in the design and operation of our military space infrastructure.

e. Space-Based Wide-Area Surveillance, Tracking, and Targeting

Space-based systems offer opportunities for wide-area surveillance to support a variety of missions, including strategic and tactical air defense, and ocean surveillance. They can provide information to improve decisionmaking which can enhance the combat effectiveness of our terrestrial forces. We are developing technologies and system concepts critical to radar and optical space-based wide-area surveillance systems. During the coming year we intend to explore with our allies the possibilities of initiating a major development program.

f. National Aerospace Plane

The National Aerospace Plane (NASP) is a high-priority program that may lead to an entirely new category of aerospace vehicles, possibly offering new operational concepts, for both military and civilian uses. Like ALS, NASP is a joint DoD-NASA program involving leading-edge technologies in materials, propulsion, and computational fluid dynamics, among

others. These technologies will then be demonstrated in an experimental flight research vehicle, the X-30. This program, and the technology spin-offs resulting from it, can help ensure America's leadership in aerospace technology. I ask that the Congress note that Japanese, West German, and other European concerns, as well as the Soviet Union, are pursuing similar programs.

4. Conclusion

For our military forces to be effective both for deterrence and in conflict, our military space infrastructure must be able to function in crises and in a conflict environment. In this regard, space systems are no different than other military systems: their effectiveness as a deterrent is directly proportional to their effectiveness and usability in combat.

Our space policy and organizational initiatives are designed to obtain the maximum security benefits from our military space missions and programs. The programmatic initiatives discussed can substantially enhance our military space capability in the future. Our challenge is to develop and field the space systems that will allow us to integrate current military doctrine and strategy effectively with the "new" operational environment of space.

Appendices

Appendix A

Department of Defense — Budget Authority by Appropriation [a]
(Dollars in Millions)

Table 1

	FY 1984	FY 1985	FY 1986 [b]	FY 1987	FY 1988	FY 1989	FY1990	FY1991
Current Dollars								
Military Personnel	48,363	67,773	67,794	74,010	76,584	78,566	79,845	82,060
Retired Pay	16,503	*	*	*	*	*	*	
Operation & Maintenance	70,950	77,803	74,888	79,607	81,629	85,939	91,725	95,518
Procurement	86,161	96,842	92,506	80,234	80,053	79,232	84,115	91,894
Research, Development, Test and Evaluation	26,867	31,327	33,609	35,644	36,521	37,542	41,025	41,252
Special Foreign Currency Program	3	9	2	4	—	—	—	—
Military Construction	4,510	5,517	5,281	5,093	5,349	5,703	5,280	5,937
Family Housing & Homeowners Assistance Program	2,669	2,890	2,803	3,075	3,199	3,266	3,280	3,671
Revolving & Management Funds	2,774	5,088	5,235	2,612	1,246	722	825	940
Trust Funds, Receipts & Deductions	−650	−447	−729	−809	−827	−784	−758	−720
Proposed Legislation	—	—	—	—	—	—	309	358
Total—Direct Program (B/A)	**258,150**	**286,802**	**281,390**	**279,469**	**283,755**	**290,186**	**305,645**	**320,909**
Constant FY 1990 Dollars								
Military Personnel	58,538	78,132	75,434	80,365	80,210	80,011	79,845	79,523
Retired Pay	20,205	*	*	*	*	*	*	*
Operation & Maintenance	84,615	91,140	86,686	89,194	88,572	89,311	91,725	92,712
Procurement	104,102	113,599	105,223	88,324	85,089	81,549	84,115	89,693
Research, Development, Test and Evaluation	32,560	36,853	38,501	39,576	39,133	38,788	41,025	40,070
Special Foreign Currency Program	4	10	2	4	—	—	—	—
Military Construction	5,481	6,505	6,051	5,637	5,704	5,878	5,280	5,784
Family Housing & Homeowners Assistance Program	3,182	3,352	3,175	3,392	3,423	3,371	3,280	3,563
Revolving & Management Funds	3,659	6,355	6,397	3,196	1,465	793	825	909
Trust Funds, Receipts & Deductions	−485	−248	−518	−475	−542	−441	−758	−697
Proposed Legislation	—	—	—	—	—	—	309	347
Total—Direct Program (B/A)	**311,861**	**335,697**	**320,952**	**309,213**	**303,054**	**299,261**	**305,645**	**311,904**

a Numbers may not add to totals due to rounding.

b Lower Budget Authority in the Military Personnel Accounts in FY 1986 reflects the congressional direction to finance $4.5 billion for the military pay raise and retirement accrual costs by transfers from prior year unobligated balances.

* Retired Pay accrual included in Military Personnel appropriation.

Department of Defense — Budget Authority by Component [a]

Table 2

(Dollars in Millions)

	FY 1984	FY 1985	FY 1986 [b]	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991
Current Dollars								
Department of the Army	62,181	74,270*	73,128*	73,994*	75,813*	78,164*	80,511*	84,056*
Department of the Navy	82,088	99,015*	96,113*	93,500*	100,281*	97,407*	101,670*	105,051*
Department of the Air Force	86,108	99,420*	94,870*	91,624*	88,324*	94,580*	100,460*	106,568*
Defense Agencies/OSD/JCS	10,746	13,126	15,520	19,185	17,021	17,954	20,816	22,977
Defense-wide	17,027	970	1,759	1,168	2,315	2,081	2,189	2,256
Total—Direct Program (B/A)	**258,150**	286,802	281,390	279,469	283,755	290,186	305,645	320,909
Constant FY 1990 Dollars								
Department of the Army	75,944	87,269*	83,537*	82,071*	80,920*	80,541*	80,511*	81,648*
Department of the Navy	99,040	116,127*	109,813*	103,234*	106,824*	100,223*	101,670*	102,152*
Department of the Air Force	102,742	115,444*	107,506*	100,894*	94,416*	97,622*	100,460*	103,592*
Defense Agencies/OSD/JCS	13,294	15,717	18,088	21,659*	18,340*	18,618*	20,816*	22,324
Defense-wide	20,840	1,140	2,008	1,354*	2,554	2,256	2,189	2,188
Total—Direct Program (B/A)	**311,861**	335,697	320,952	309,213	303,054	299,261	305,645	311,904

a Numbers may not add to totals due to rounding.

b Lower Budget Authority in the Military Personnel Accounts in FY 1986 reflects the congressional direction to finance $4.5 billion for the military pay raise and retirement accrual costs by transfers from prior year unobligated balances.

* Includes Retired Pay accrual.

Federal Budget Trends
(Dollars in Millions)

Table 3

Fiscal Year	Federal Outlays as a % of GNP	DoD Outlays as a % of Federal Outlays	DoD Outlays as a % of GNP	Non-DoD Outlays as a % of Federal Outlays	Non-DoD Outlays as a % of GNP	DoD Outlays as a % of Net Public Spending*
1950	16.0	27.5	4.4	72.5	11.6	17.9
1955	17.6	51.5	9.1	48.5	8.6	34.5
1960	18.2	45.0	8.2	55.0	10.0	28.8
1965	17.5	38.8	6.8	61.2	10.7	23.8
1970	19.8	39.4	7.8	60.6	12.0	23.6
1971	19.9	35.4	7.0	64.6	12.8	20.6
1972	20.0	32.6	6.5	67.4	13.5	18.8
1973	19.1	29.8	5.7	70.2	13.4	17.1
1974	19.0	28.8	5.5	71.2	13.5	16.6
1975	21.8	25.5	5.6	74.5	16.2	15.1
1976	21.9	23.6	5.2	76.4	16.7	14.0
1977	21.1	23.4	4.9	76.6	16.2	14.0
1978	21.1	22.5	4.7	77.5	16.4	13.6
1979	20.5	22.8	4.7	77.2	15.8	13.8
1980	22.2	22.5	5.0	77.5	17.2	13.8
1981	22.7	23.0	5.2	77.0	17.5	14.4
1982	23.7	24.5	5.8	75.5	17.9	15.5
1983	24.3	25.4	6.2	74.6	18.2	16.1
1984	23.1	25.9	6.0	74.1	17.1	16.3
1985	24.0	25.9	6.2	74.1	17.8	16.4
1986	23.6	26.8	6.3	73.2	17.3	16.7
1987	22.6	27.3	6.2	72.7	16.4	16.8
1988	22.3	26.5	5.9	73.5	16.4	16.3
1989	22.2	25.5	5.7	74.5	16.5	15.5
1990	21.1	25.5	5.4	74.5	15.7	15.5
1991	20.6	25.2	5.2	74.8	15.4	15.3

* Federal, state, and local net spending excluding government enterprises (such as the postal service and public utilities) except for any support these activities receive from tax funds.

Defense Shares of Economic Aggregates

Table 4

Fiscal Year	DoD as a Percentage of Public Employment — Federal	DoD as a Percentage of Public Employment — Federal State & Local	DoD as a Percentage of National Labor Force — Direct Hire (DoD)	DoD as a Percentage of National Labor Force — Including Industry	National Income Accounts Percentage of Total Purchases — National Defense*	National Income Accounts Percentage of Total Purchases — Total Federal	National Income Accounts Percentage of Total Purchases — State & Local
1965	71.3	29.3	5.0	7.8	7.3	9.8	9.8
1966	73.0	30.6	5.6	9.0	7.5	10.0	10.0
1967	74.1	31.5	6.0	10.0	8.7	11.0	10.4
1968	74.0	31.3	6.1	10.0	9.0	11.4	10.8
1969	73.2	30.1	5.9	9.4	8.5	10.8	11.0
1970	72.3	27.7	5.3	8.1	7.9	10.1	11.4
1971	68.3	24.3	4.6	7.0	7.1	9.3	12.0
1972	66.0	21.5	4.0	6.2	6.6	9.0	12.0
1973	65.0	20.4	3.7	5.8	6.0	8.2	11.8
1974	63.8	19.4	3.5	5.5	5.6	7.7	12.0
1975	62.9	18.6	3.4	5.3	5.7	8.1	12.8
1976	62.5	18.1	3.3	5.0	5.4	7.8	12.7
1977	62.5	17.5	3.2	5.0	5.1	7.6	11.9
1978	61.9	17.0	3.1	4.8	4.9	7.3	11.8
1979	61.1	16.5	2.9	4.7	4.8	7.1	11.5
1980	61.3	16.5	2.8	4.7	5.1	7.5	11.8
1981	62.4	17.1	2.8	4.7	5.4	7.8	11.4
1982	63.2	17.4	2.8	4.9	6.0	8.4	11.5
1983	63.5	17.6	2.9	5.1	6.3	8.7	11.6
1984	63.5	17.6	2.8	5.3	6.2	8.1	11.2
1985	63.3	17.5	2.9	5.5	6.4	8.7	11.5
1986	63.2	17.2	2.8	5.6	6.6	8.8	11.8
1987	62.9	17.0	2.8	5.6	6.5	8.5	12.0
1988	61.8	16.4	2.7	5.4	6.2	7.9	12.0

* Includes Department of Defense—military, atomic energy defense activities, and other defense-related activities, such as emergency management and maintenance of strategic stockpiles and the Selective Service System.

Appendix B

Department of Defense
General and Flag Officer Strengths

Table 1

Actual	General & Flag Officer Strengths	General & Flag Officers Per 10,000 Total Military
1961	1,254	5.0
1962	1,303	4.6
1963	1,292	4.8
1964	1,294	4.8
1965	1,287	4.8
1966	1,320	4.3
1967	1,334	4.0
1968	1,352	3.8
1969	1,336	3.9
1970	1,339	4.4
1971	1,330	4.9
1972	1,324	5.7
1973	1,291	5.7
1974	1,249	5.8
1975	1,199	5.6
1976	1,184	5.7
1977	1,159	5.6
1978	1,119	5.4
1979	1,119	5.5
1980	1,118	5.4
1981	1,073	5.2
1982	1,073	5.1
1983	1,073	5.1
1984	1,073	5.0
1985	1,073	5.0
1986	1,073	5.0
1987	1,073	4.9
1988	1,073	5.0
Programmed		
1989	1,073	5.0
1990	1,073	5.0
1991	1,073	5.0

Military and Civilian Personnel Strength [a]
(End Fiscal Years - In Thousands)

Table 2

	Actual										Programmed		
	FY 1976	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989	FY 1990	FY 1991
Active Component Military													
Army	779	777	781	780	780	780	781	781	781	772	772	772	772
Navy	524	517	529	542	558	565	571	581	587	593	593	598	598
Marine Corps	192	188	191	192	194	196	198	199	200	197	197	197	197
Air Force	585	558	570	583	592	597	602	608	607	576	571	571	567
Total	2,081	2,040	2,071	2,097	2,123	2,138	2,151	2,169	2,174	2,138	2,133	2,138	2,135
Reserve Component Military (Selected Reserve)													
ARNG	362	367	389	408	417	434	440	446	452	455	457	458	459
Army Reserve	195	213	232	257	266	275	292	310	314	313	319	322	324
Naval Reserve[b]	97	97	98	105	109	121	130	142	148	149	153	153	154
MC Reserve	30	36	37	40	43	41	42	42	42	44	44	44	44
ANG	91	96	98	101	102	105	109	113	115	115	115	116	116
Air Force Reserve	48	60	62	64	67	70	75	79	80	82	84	85	85
Total	823	869	917	975	1,005	1,046	1,088	1,130	1,151	1,158	1,171	1,178	1,182
Direct Hire Civilian													
Army[c]	329	312	318	321	332	344	359	354	358	337	342	345	345
Navy	311	298	310	308	328	332	342	332	343	338	335	329	327
Air Force[c]	248	231	233	235	238	240	250	250	252	241	250	249	249
Defense Agencies	71	75	79	80	81	85	91	92	96	95	97	96	95
Total	959	916	940	945	980	1,000	1,043	1,027	1,049	1,010	1,023	1,019	1,016

a Numbers may not add to totals due to rounding.
b Navy Training and Administration of Reserves (TARs) personnel are counted in the Selected Reserve from FY 1980 on. Prior to FY 1980, TAR personnel are included in the Active Military.
c These totals include Army and Air National Guard technicians, who were converted from State to Federal employees in FY 1979.

U. S. Military Personnel in Foreign Areas [a]
(End-Year In Thousands)

Table 3

	FY 1976[b]	FY 1979	FY 1980	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985	FY 1986	FY 1987	FY 1988
Germany	213	239	244	248	256	254	254	247	250	251	249
Other Europe	61	61	65	64	67	70	73	75	75	73	74
Europe, Afloat	41	25	22	25	33	18	25	36	33	31	33
South Korea	39	39	39	38	39	39	41	42	43	45	46
Japan	45	46	46	46	51	49	46	47	48	50	50
Other Pacific	18	15	15	16	15	15	16	16	17	18	17
Pacific Afloat (Including Southeast Asia)	27	22	16	25	33	34	18	20	20	17	28
Latin America/ Caribbean	11	12	11	12	11	14	13	12	13	13	15
Miscellaneous Foreign	12	9	31	27	23	27	25	20	26	27	29
Total	**469**	**468**	**489**	**502**	**528**	**520**	**511**	**515**	**525**	**524**	**541**

a Numbers may not add to totals due to rounding.
b September 30 data used for consistency.

Appendix C

Department of Defense
Strategic Forces Highlights

Table 1

	FY 1980	FY 1984	FY 1986	FY 1988	FY 1989	FY 1990	FY 1991
Strategic Offense							
Land-Based ICBMs[a]							
Titan	52	32	7	—	—	—	—
Minuteman	1,000	1,000	998	954	950	950	950
Peacekeeper	—	—	2	46	50	50	50
Strategic Bombers (PAA)[b]							
B-52D	75	—	—	—	—	—	—
B-52G/H	241	241	241	234	173	173	173
B-1B	—	—	18	90	90	90	90
Fleet Ballistic Missile Launchers (SLBMs)[a]							
Polaris	80	—	—	—	—	—	—
Poseidon (C-3 and C-4)	336	384	320	336	352	368	368
Trident	—	72	144	192	192	240	264
Strategic Defense Interceptors (PAA/Squadrons)[b]							
Active	127/7	90/5	76/4	36/2	36/2	18/1	18/1
Air National Guard	165/10	162/10	198/1	216/12	216/12	216/12	216/12

[a] Number on-line.
[b] Primary aircraft authorized.

Table 2

Department of Defense
General Purpose Forces Highlights

	FY 1980	FY 1984	FY 1986	FY 1988	FY 1989	FY 1990	FY 1991
Land Forces							
Army Divisions:							
Active	16	16	18	18	18	18	18
Reserve	8	8	10	10	10	10	10
Marine Corps Divisions:							
Active	3	3	3	3	3	3	3
Reserve	1	1	1	1	1	1	1
Army Separate Brigades: [a]							
Active	8	8	7	8	8	8	8
Reserve	26	23	20	20	20	20	20
Army Special Forces Groups:							
Active	2	4	4	4	4	5	5
Reserve	4	4	4	4	4	4	4
Army Ranger Regiment	0	0	1	1	1	1	1
Tactical Air Forces (PAA/Squadrons) [b]							
Air Force Attack and Fighter Aircraft							
Active	1,608/74	1,734/77	1,764/78	1,762/79	1,770//79	1,662/75	1,710/75
Reserve	758/36	852/43	876/43	894/43	876/42	864/42	828/42
Conventional Bombers							
B-52G/H	0	0	0	0	61	47	47
Navy Attack and Fighter Aircraft							
Active	696/60	616/63	758/65	758/67	770/65	768/66	768/66
Reserve	120/10	75/9	107/10	121/10	118/10	116/10	116/10
Marine Corps Attack and Fighter Aircraft							
Active	329/25	256/24	333/25	346/25	351/25	369/26	385/27
Reserve	84/7	90/8	94/8	96/8	96/8	96/8	96/8
Naval Forces							
Strategic Forces Ships	48	41	45	43	42	41	41
Battle Forces Ships	384	425	437	437	434	435	425
Support Forces Ships	41	46	55	60	65	68	70
Reserve Forces Ships	6	12	18	25	27	30	35
Total Deployable Battle Forces	479	524	555	565	568	574	571
Other Reserve Forces Ships	44	24	21	21	21	20	16
Other Auxiliaries	8	9	7	5	5	4	4
Total Other Forces	52	33	28	26	26	24	20

[a] Does not include roundout brigades; does include the eskimo scout group and the armored cavalry regiments.
[b] PAA - Primary Aircraft Authorized.

Department of Defense
Airlift and Sealift Forces Highlights

Table 3

	FY 1980	FY 1984	FY 1986	FY 1988	FY 1989	FY 1990	FY 1991
Intertheater Airlift (PAA) [a]							
C-5A	70	70	66	66	66	66	66
C-5B	—	—	5	32	44	44	44
C-141	234	234	234	234	234	234	234
KC-10A	—	25	48	57	57	57	57
C-17	—	—	—	—	—	—	2
Intratheater Airlift (PAA) [a] **Air Force**							
C-130	482	520	504	521	513	434	430
C-123	64	—	—	—	—	—	—
C-7A	48	—	—	—	—	—	—
Navy and Marine Corps							
Tactical Support	97	85	88	92	92	92	92
Sealift Ships, Active							
Tankers	21	21	24	20	20	27	27
Cargo	23	30	40	41	41	43	43
Reserve [b]	26	106	122	144	151	156	151

[a] PAA — Primary aircraft authorized.
[b] Includes useful National Defense Reserve Fleet ships and the Ready Reserve Force.

Appendix D

GLOSSARY

AAAM	Advanced Air-to-Air Missile
AAW	Antiair Warfare
AAWS-H	Antiarmor Weapon System (Heavy)
AAWS-M	Antiarmor Weapon System (Medium)
AAWWS	Airborne Adverse Weather Weapon System
ABM	Antiballistic Missile
AC	Active Component
ACCS	Army Command and Control System
ACM	Advanced Cruise Missile
ACMI	Air Combat Maneuvering Instrumented
ACP	Aviator Continuation Pay
ACS	African Coastal Security
ACV	Air Cushion Vehicle
ADA	DoD Computer Programming Language
ADCAP	Advanced Capability (torpedo)
ADDS	Army Data Distribution System
ADI	Air Defense Initiative
ADP	Automated Data Processing
ADVCAP	Advanced Capability
AFAP	Artillery-Fired Atomic Projectile
AFATDS	Advanced Field Artillery Tactical Data System or Army Field Artillery Tactical Data System
AFV	Armored Family of Vehicles
AHIP	Army Helicopter Improvement Program
AID	Agency for International Development
AIDS	Acquired Immunodeficiency Syndrome
AIM	Air-Intercept Missile
AIWS	Advanced Interdiction Weapon System
ALCM	Air-Launched Cruise Missile
ALMV	Air-Launched Miniature Vehicle
ALS	Advanced Launch System
AMRAAM	Advanced Medium-Range Air-to-Air Missile
ANZUS	Australia-New Zealand-United States (Treaty)
APAS	Alternative Performance Appraisal System
ASAS	All Source Analysis System
ASAT	Antisatellite
ASDS	Advanced SCM Delivery System
ASEAN	Association of Southeast Asian Nations
ASPJ	Airborne Self-Projection Jammer
ASRAAM	Advanced Short-Range Air-to-Air Missile
ASTP	Advanced Space Technology Program
ASUW	Antisurface Warfare
ASW	Antisubmarine Warfare
ATA	Advanced Tactical Aircraft
ATACMS	Army Tactical Missile System
ATARS	Advanced Tactical Air Reconnaissance System
ATCCS	Army Tactical Command and Control System
ATF	Advanced Tactical Fighter
ATS	Advanced Tactical Support
ATSD (IO)	Assistant to the Secretary of Defense (Intelligence Oversight)
ATSS	Advanced Tactical Support System
AUTOVON	Automatic Voice Network

AWACS	Airborne Warning and Control System
BA	Budget Authority
BLSS	Base-Level Self-Sufficiency Spares
BM/C^3	Battle Management/Command, Control, and Communications
BMD	Ballistic Missile Defense
BMEWS	Ballistic Missile Early Warning System
BSTS	Boost Surveillance and Tracking System
BTI	Balanced Technology Initiative
C^2	Command and Control
C^3	Command, Control, and Communications
C^{3}I	Command, Control, Communications, and Intelligence
CAPS	Conventional Armaments Planning System
CBM	Confidence-Building Measures
CBR	Chemical, Biological, Radiological
CD	Conference on Disarmament
CDE	Conference on Disarmament in Europe
CDI	Conventional Defense Improvements
CDIP	Combined Defense Improvements Projects
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
CINC	Commander in Chief
CINCCENT	Commander in Chief, U.S. Central Command
CIWS	Close-in Weapon System
CMTC	Combat Maneuver Training Center
CNASP	Chairman's Military Net Assessment for Strategic Planning
COCOM	Coordinating Committee for Multilateral Export Controls
COMPUSEC	Computer Security
COMSEC	Communications Security
CONUS	Continental United States
CORRTEX	Continuous Reflectometry for Radius Versus Time Experiments
CRAF	Civil Reserve Air Fleet
CRAG	Contractor Risk Assessment Guides
CS	Competitive Strategies
CSBM	Confidence- and Security-Building Measures
CSCE	Conference on Security and Cooperation in Europe
CSI	Competitive Strategies Initiative
CSSCS	Combat Service Support Control System
CST	Conventional Stability Talks
CTB	Comprehensive Test Ban
CTJTF	Counter-Terrorist Joint Task Force
CV	Aircraft Carrier
CVBG	Carrier Battle Group
CVHQ	Guided-Missile VSTOL Aircraft Carrier
CW	Chemical Weapons
CVN	Aircraft Carrier, Nuclear-Powered
CY	Calendar Year or Current Year
DAACM	Direct Airfield Attack Combined Munition
DAB	Defense Acquisition Board

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DAR	Defense Acquisition Regulatory (Council)	FMTV	Family of Medium Tactical Vehicles
DARE	Drug Abuse Resistance Education	FMS	Foreign Military Sales
DARPA	Defense Advanced Research Projects Agency	FMSCR	Foreign Military Sales Credit (Financing)
		FOG-M	Fiber Optic Guided Missile
DCA	Dual-capable Aircraft	FOFA	Follow-On Forces Attack
DCAA	Defense Contract Audit Agency	FORSCOM	Forces Command
DCIMI	Defense Council on Integrity and Management Improvement	FOTL	Follow-On to Lance
		FSD	Full-Scale Development
DCL	Direct Communications Link	FWE	Foreign Weapons Evaluation
DCS	Defense Communications System	FY	Fiscal Year
DDDR&E (T&E)	Deputy Director, Defense Research and Engineering (Test and Evaluation)	FYDP	Five-Year Defense Program
		GC	General Counsel
DDG	Guided Missile Destroyer	GAO	General Accounting Office
DDN	Defense Data Network	GFM	Government-Furnished Material
DDS	Dry Deck Shelters	GLCM	Ground-Launched Cruise Missile
DEA	Drug Enforcement Agency	GNP	Gross National Product
DEPMEDS	Deployable Medical Systems	GPS	Global Positioning System
DEW	Directed-Energy Weapons or Distant Early Warning	GWEN	Ground Wave Emergency Network
DIA	Defense Intelligence Agency	HARM	High-Speed Antiradiation Missile
DINET	Defense Industrial Network or Defense Industrial Base Network	HEDI	High Endoatmospheric Defense Interceptor
DLA	Defense Logistics Agency	HEMTT	Heavy Expanded Mobility Tactical Truck
DMA	Defense Mapping Agency		
DNA	Defense Nuclear Agency	HIV	Human Immunodeficiency Virus
DoD	Department of Defense	HLG	High-Level Group
DoDDs	Department of Defense Dependents Schools	HMMWV	High Mobility Multipurpose Wheeled Vehicle
DOT&E	Director, Operational Test and Evaluation	HNS	Host-Nation Support
		HOE	Homing Overlay Experiment
DRB	Defense Resources Board		
DRG	Diagnosis Related Group	ICBM	Intercontinental Ballistic Missile
DSB	Defense Science Board	IFF	Identification Friend or Foe
DSC	Defense Space Council	IG	Inspector General
DSCS	Defense Satellite Communications System	IHPTET	Integrated High Performance Turbine Engine Technology
DSN	Defense Switched Network	IIR	Imaging Infrared
DST	Defense and Space Talks	IMC	Internal Management Control
DTSA	Defense Technology Security Administration	IMET	International Military Education and Training
		IMIP	Industrial Modernization Incentives Program
EADTB	Extended Air Defense Test Bed		
EC	Electronic Combat	INEWS/ICNIA	Integrated Electronic Warfare System/Integrated Communication/Navigation/Identification Avionics
ECCM	Electronic Counter-Countermeasures		
ECI	Employment Cost Index		
ECM	Electronic Countermeasures		
ELF	Extremely Low Frequency	INF	Intermediate-Range Nuclear Forces
ELV	Expendable Launch Vehicle	ING	Inactive National Guard
EMP	Electromagnetic Pulse	IR	Infrared
ESM	Electronic Support Measures	IRBM	Intermediate-Range Ballistic Missile
EW	Electronic Warfare	IR&D	Independent Research and Development
		IRR	Individual Ready Reserve
FAADS	Forward Area Air Defense System	IRS	Internal Revenue Service
FAAO	Field Artillery Aerial Observer		
FF	Frigate	JCACC	Joint Contract Administration Coordinating Council
FFG	Guided Missile Frigate		
FFL	Corvette	JCS	Joint Chiefs of Staff
FLAGE	Flexible Lightweight Agile Guided Experiment	JMMC	Joint Military Medical Command
		JSTARS	Joint Surveillance/Target Attack Radar System
FLIR	Forward-Looking Infrared		
FMFP	Foreign Military Financing Program	JRTC	Joint Readiness Training Center
FMLN	Farabundo Marti National Liberation Front	JSIPS	Joint Services Imagery Processing System

JT&E	Joint Test and Evaluation	MYP	Multiyear Procurement
JTFME	Joint Task Force Middle East	MWR	Morale, Welfare, and Recreation
JTIDS	Joint Tactical Information Distribution System	NADIB	North American Defense Industrial Base
JVE	Joint Verification Experiment	NAMSA	NATO Maintenance and Supply Agency
		NASP	National Aerospace Plane
KEW	Kinetic Energy Weapons	NATF	Navy Advanced Tactical Fighter
		NATO	North Atlantic Treaty Organization
LANTIRN	Low-Altitude Navigation and Targeting Infrared System for Night	NAVSTAR	Navigation Satellite Timing and Ranging
		NCA	National Command Authorities
LCAC	Landing Craft, Air Cushioned	NCT	NATO Comparative Test
LDCs	Lesser-Developed Countries	NDMS	National Disaster Medical System
LCS	Low Cost Seeker	NDS	Nuclear Detonation Detection System or National Defense Stockpile
LEDET	Law Enforcement Detachment		
LF	Low Frequency	NDSB	Nuclear Depth Strike Bomb
LFT	Live Fire Testing	NEPA	National Environmental Policy Act
LHD-1	Amphibious Assault Ship, WASP-Class	NFIP	National Foreign Intelligence Program
LHX	Light Helicopter Experimental	NMCC	National Military Command Center
LIC	Low-Intensity Conflict	NNSC	Nonnuclear Strategic Capabilities
LLOC	Land Lines of Communications	NORAD	North American Aerospace Defense Command
LO	Low-Observable		
LOC	Lines of Communication	NPG	Nuclear Planning Group
LOS-F-H	Line-of-Sight Forward-Heavy	NRRC	Nuclear Risk Reduction Center
LPD	Amphibious Assault Transport Dock	NSA	National Security Agency
LRAACA	Long-Range Air ASW Capability Aircraft	NSC	National Security Council
		NSDD	National Security Decision Directive
LRINF	Longer Range Intermediate-Range Nuclear Forces	NSNF	Nonstrategic Nuclear Forces
		NTC	National Training Center
LTACFIRE	Light Tactical Fire Direction	NTPF	Near-Term Prepositioning Forces
LVS	Logistics Vehicle System	NWS	North Warning System
MAD	Mutual Assured Destruction	ODC	Office of Defense Cooperation
MAGTF	Marine Air-Ground Task Force	O&M	Operations and Maintenance
MANTECH	Manufacturing Technology	OJCS	Organization of the Joint Chiefs of Staff
MAP	Military Assistance Program		
MCE	Modular Control Equipment	OMB	Office of Management and Budget
MC&G	Mapping, Charting & Geodesy	OPTEMPO	Operating Tempo
MCS	Maneuver Control System	OSD	Office of the Secretary of Defense
MEB	Marine Expeditionary Brigade	OSIA	On-Site Inspection Agency
MEF	Marine Expeditionary Force	OT&E	Operational Test and Evaluation
ME/SWA	Middle East/Southwest Asia	OTH	Over-the-Horizon
MFO	Multinational Forces and Observers	OTHB	Over-the-Horizon Backscatter (radar)
MFP	Major Force Program		
MHE	Material-Handling Equipment	PAVE PAWS	Phased-Array Radars
MHSS	Military Health Service System	PGG	Guided-Missile Patrol Craft
MIDEASTFOR	Middle East Force	PHTK	Prompt Hard-Target-Kill
MiG	Mikoyan-Gurevich (Soviet designed aircraft)	PIOB	President's Intelligence Oversight Board
		PIP	Productivity Improvement Program
MILCON	Military Construction	PKO	Peacekeeping Operations
MILSTAR	Military Strategic and Tactical Relay System	PLRS	Position, Location, and Reporting System
MIRV	Multiple Independently Targetable Reentry Vehicle	PLS	Palletized Loading System
		PMS	Pedestal Mounted Stinger
MLRS	Multiple-Launch Rocket System	PNET	Peaceful Nuclear Explosion Treaty
MMAS	Material Management and Accounting System	POL	Petroleum, Oil, and Lubricants
		POMCUS	Prepositioning of Materiel Configured to Unit Sets
MOU	Memorandum of Understanding		
MRT	Miniature Receiver Terminal	PPBS	Planning, Programming, and Budgeting System
MSE	Mobile Subscriber Equipment		
MSF	Fleet Minesweeper	PRC	People's Republic of China
MSFT	Fleet Minesweeper (Trainer)		
MSIP	Multi-Staged Improvement Program	QRMC	Quadrennial Review of Military Compensation
MSO	Military Service Obligation		
MTM/D	Million Ton-Miles Per Day		

R&D	Research and Development	SURTASS	Surveillance Towed-Array Sonar System
RC	Reserve Component	SVC	Special Verification Commission
RDT&E	Research, Development, Test, and Evaluation	SWA	Southwest Asia
REACT	Rapid Execution and Combat Targeting	TACAMO	Take Charge and Move Out
REFORGER	Return of Forces to Germany (Exercise)	TAOM	Tactical Air Operations Module
ROK	Republic of Korea	TARS	Tactical Air Reconnaissance System
ROTHR	Relocatable Over-the-Horizon Radar	T&E	Test and Evaluation
RPM	Real Property Maintenance	TACTS	Tactical Aircrew Training System
RPV	Remotely Piloted Vehicle	TASM	Tactical Air-to-Surface Missile
RRF	Ready Reserve Force	TFW	Tactical Fighter Wing
RSIP	Radar System Improvement Program	TIARA	Tactical Intelligence and Related Activities
RV	Reentry Vehicle	TLAM	Tomahawk Land-Attack Missile
SAC	Strategic Air Command	TOA	Total Obligational Authority
SACEUR	Supreme Allied Commander, Europe	TOW	Tube-Launched, Optically Tracked, Wire-Guided (antitank missile)
SADARM	Sense and Destroy Armor Munition		
SALT	Strategic Arms Limitation Treaty or Strategic Arms Limitation Talks	TQM	Total Quality Management
		TTBT	Threshold Test Ban Treaty
SAM	Surface-to-Air-Missile, or Sea Air Mariner	TTTS	Tanker Transport Training System
		UARV	Unmanned Air Reconnaissance Vehicle
SASC	Senate Armed Services Committee	UHF	Ultrahigh Frequency
SDAF	Special Defense Acquisition Fund	URI	University Research Initiative
SDI	Strategic Defense Initiative	USCENTCOM	United States Central Command
SDIO	Strategic Defense Initiative Organization	USCINCCENT	United States Commander in Chief, Central Command
SDS	Strategic Defense System		
SEAL	Sea-Air-Land	USCINCEUR	United States Commander in Chief, Europe
SEMATECH	Semiconductor Manufacturing Technology Institute		
		USCINCLANT	United States Commander in Chief, Atlantic Command
SES	Senior Executive Service		
SFW	Sensor-Fuzed Weapon	USCINCPAC	United States Commander in Chief, Pacific Command
SIC	Senior Intelligence Committee		
SICBM	Small ICBM	USCINCSO	United States Commander in Chief, Southern Command
SINCGARS	Single Channel Ground and Airborne System		
		USCINCSOC	United States Commander in Chief, Special Operations Command
SINCGARS-V	Single Channel Ground and Airborne System, VHF		
		USCINCSOUTH	United States Commander in Chief, Southern Command
SLAM	Standoff Land-Attack Missile		
SLAT	Supersonic Low-Altitude Target	USCINCSPACE	United States Commander in Chief, Space Command
SLBM	Submarine-Launched Ballistic Missile		
SLCM	Submarine-Launched Cruise Missile	USD (A)	Under Secretary of Defense (Acquisition)
SLOC	Sea Lines of Communications		
SM	Standard Missile	USD (P)	Under Secretary of Defense (Policy)
SNA	Soviet Naval Aviation	USNS	U.S. Navy Ship
SNF	Short-Range Nuclear Forces	USSOCOM	United States Special Operations Command
SOF	Special Operations Forces		
SRAM	Short-Range Attack Missile	USSR	Union of Soviet Socialist Republics
SSA	Auxiliary Submarine	USSPACECOM	United States Space Command
SSAN	Nuclear Auxiliary Submarine	USSOUTHCOM	United States Southern Command
SSB	Ballistic Missile Submarine	USTRANSCOM	United States Transportation Command
SSBN	Ballistic Missile Submarine, Nuclear-Powered		
		VA	Veterans Administration
SSG	Guided-Missile Attack Submarine	VE	Value Engineering
SSGN	Cruise Missile Attack Submarine, Nuclear-Powered	VHA	Variable Housing Allowance
		VHF	Very High Frequency
SSN	Attack Submarine, Nuclear-Powered	VLA	Vertical Launch ASROC
SSQN	Nuclear Communications Submarine	VLF	Very Low Frequency
SSS	Selective Service System	VLF/LF	Very Low Frequency/Low Frequency
SST	Training Submarine	VLS	Vertical Launch System
SSTC	Space Systems Test Capabilities	V/STOL	Vertical/Short Take-Off and Landing
S&T	Science and Technology		
START	Strategic Arms Reduction Talks	WARMAPS	Wartime Manpower Planning System
STIC	SEAL Tactical Insertion Craft	WFF	Frigate (Paramilitary)
SSUN	Submarine (function unknown)	WFFL	Corvette (Paramilitary)

WIG	Wing-in-Ground
WIS	WWMCCS Information Systems
WPG	Patrol Craft (Paramilitary)
WRSK	War Reserve Spare Kits
WWMCCS	Worldwide Military Command and Control System
WTVD	Western Theater of Operations